lenovo

Hardware Maintenance Manual

Lenovo V570, B570, and B570e

Note: Before using this information and the product it supports, be sure to read the general information under Appendix A “Notices” on page 87.

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About this manual

This manual contains service and reference information for the following Lenovo® products.

Product	Machine type (MT)
Lenovo V570	1066, 20092
Lenovo B570	1068, 20093
Lenovo B570e	5215, 20173

Use this manual to troubleshoot problems.

The manual is divided into the following sections:

- The common sections provide general information, guidelines, and safety information required for servicing computers.
- The product-specific section includes service, reference, and product-specific parts information.

Important:

This manual is intended only for trained service technicians who are familiar with Lenovo products. Use this manual to troubleshoot problems effectively.
Before servicing a Lenovo product, be sure to read all the information under Chapter 1 “Safety information” on page 1 and Chapter 2 “Important service information” on page 27.

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Chapter 1. Safety information

This chapter presents following safety information that you need to be familiar with before you service a Lenovo Notebook.

- “General safety” on page 1
- “Electrical safety” on page 2
- “Safety inspection guide” on page 3
- “Handling devices that are sensitive to electrostatic discharge” on page 3
- “Grounding requirements” on page 4
- “Safety notices (multilingual translations)” on page 4
- “Laser compliance statement (multilingual translations)” on page 19

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Make sure that you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. Do not attempt to lift any object that weighs more than 16 kg (35 lb) or that you think is too heavy for you.
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, make sure that other service technicians and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your toolcase away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Make sure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, about 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing, because metal objects are good electrical conductors.
- Wear safety glasses when you are hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.
- Fan louvers on the machine help to prevent overheating of internal components. Do not obstruct fan louvers or cover them with labels or stickers.

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Electrical safety

Observe the following rules when working on electrical equipment.

Important:

Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents.
Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing main units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine, and to lock the wall box in the off position.
- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.

    Attention: Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.

    Attention: An electrical shock can occur only when there is a complete circuit. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

  Observe the special safety precautions when you work with very high voltages; Instructions for these precautions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.
- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators
  - Similar units to listed above

  This practice ensures correct grounding of the units.
- If an electrical accident occurs:

– Caution: do not become a victim yourself.
– Switch off power.
– Send another person to get medical aid.

Safety inspection guide

The purpose of this inspection guide is to assist you in identifying potentially unsafe conditions. As each machine was designed and built, required safety items were installed to protect users and service technicians from injury. This guide addresses only those items. You should use good judgment to identify potential safety hazards due to attachment of non-Lenovo features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock)
- Explosive hazards, such as a damaged CRT face or a bulging capacitor
- Mechanical hazards, such as loose or missing hardware

To determine whether there are any potentially unsafe conditions, use the following checklist at the beginning of every service task. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power off the computer. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and the frame ground.
   b. The power cord should be the type specified in the parts list.
   c. Insulation must not be frayed or worn.
4. Check for cracked or bulging batteries.
5. Remove the cover.
6. Check for any obvious non-Lenovo alterations. Use good judgment as to the safety of any non-Lenovo alterations.
7. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
8. Check for worn, frayed, or pinched cables.
9. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling devices that are sensitive to electrostatic discharge

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD.) ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.

2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

  Note: The use of a grounding system to guard against ESD damage is desirable but not necessary.

  – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
  – When working on a double-insulated or battery-operated system, use an ESD common ground or reference point. You can use coax or connector-outside shells on these systems.
  – Use the round ground prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices (multilingual translations)

The safety notices in this section are provided in the following languages:
- English
- Arabic
- Brazilian Portuguese
- French
- German
- Hebrew
- Japanese
- Korean
- Spanish
- Traditional Chinese

DANGER

Before the computer is powered on after FRU replacement, make sure that all screws, springs, and other small parts are in place and are not left loose inside the computer. Verify this by shaking the computer and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

DANGER

Some standby batteries contain a small amount of nickel and cadmium. Do not disassemble a standby battery, recharge it, throw it into fire or water, or short-circuit it. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

DANGER

The battery pack contains small amounts of nickel. Do not disassemble it, throw it into fire or water, or short-circuit it. Dispose of the battery pack as required by local ordinances or regulations. Use only the battery in the appropriate parts listing when replacing the battery pack. Use of an incorrect battery can result in ignition or explosion of the battery.

DANGER

The lithium battery can cause a fire, an explosion, or a severe burn. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. Use only the battery in the appropriate parts listing. Use of an incorrect battery can result in ignition or explosion of the battery.

DANGER

If the LCD breaks and the fluid from inside the LCD gets into your eyes or on your hands, immediately wash the affected areas with water for at least 15 minutes. Seek medical care if any symptoms from the fluid are present after washing.

DANGER

To avoid shock, do not remove the plastic cover that protects the lower part of the inverter card.

DANGER

Though the main batteries have low voltage, a short-circuited or grounded battery can produce enough current to burn personnel or combustible materials.

DANGER

Unless hot swap is allowed for the FRU being replaced, do as follows before removing it: power off the computer, unplug all power cords from electrical outlets, remove the battery pack, and disconnect any interconnecting cables.

قبل اعادة تشغيل الحاسب بعد الانتهاء من استبدال FRU، تأكد من أنه قد تم اعادة كل من المسامير و السوست وكل الأجزاء الصغيرة الأخرى في أماكنهم ولم يتم فقدهم داخل الحاسب. ويمكن التحقق من ذلك عن طريق هز الحاسب والاستماع لأي صوت صاخب يصدر منه. قد تؤدي الأجزاء أو الرقائق المعدنية الى حدوث دائرة قصر.

تحتوي بعض البطاريات الاحتياطية على كمية صغيرة من مادتي النيكل والكادميوم. لا تقم بفك أو اعادة شحن البطارية الاحتياطية ولا تقم أيضا بالقاءها في النار أو الماء ولا تتسبب في احداث دائرة قصر بها. قم بالتخلص من البطارية كما هو موضح في القوانين المحلية. استخدم نوع البطارية المحدد والذي يوصى باستخدامه. حيث أنه قد يؤدي استخدام نوع بطارية غير صحيح الى اشتعالها أو انفجارها.

تحتوي حزمة البطارية على كمية صغيرة من مادة النيكل. لا تقم بفكها أو القاءها في النار أو الماء ولا تتسبب في احداث دائرة قصر بها. تخلص من حزمة البطارية وفقا لما هو موضح في القوانين المحلية. قم، عند استبدال حزمة البطارية، باستخدام الأنواع المحددة فقط والتي يوصى باستخدامها. حيث أنه قد يؤدي استخدام نوع بطارية غير صحيح الى اشتعالها أو انفجارها.

قد تتسبب بطارية الليثيوم في حدوث حريق أو انفجار أو حدوث حروق شديدة. لا تقم باعادة شحن البطارية أو ازالة موصل الاستقطاب الخاص بها ولا تحاول أيضا فكها أو تسخينها لأكثر من ١٠٠ درجة مئوية (٢١٢ فهرنهايت) أو حرقها أو تعريض محتويات الخانة الخاصة بها للماء. قم بالتخلص من البطارية وفقا لما هو موضح في القوانين المحلية. استخدم نوع البطارية المحدد والذي يوصى باستخدامه. حيث أنه قد يؤدي استخدام نوع بطارية غير صحيح الى اشتعالها أو انفجارها.

اذا ما انكسرت شاشة LCD ولامس السائل الداخلي عينيك أو يديك، قم في الحال بغسلهما بالماء لمدة لا تقل عن ١٥ دقيقة. اذا ما وجدت أي أعراض بعد الغسل اطلب عندئذ المساعدة الطبية.

لتجنب التعرض لأي صدمات، لا تقم بازالة الغطاء البلاستيكي الذي يحمي الجزء الأسفل من بطاقة العاكس.

على الرغم من أن البطاريات الرئيسية يكون لها جهد منخفض، الا أنه قد تقوم البطاريات التي حدث قصور بها أو التي تم توصيلها أرضيا باصدار تيار يكفي لحدوث حروق للأفراد أو تعرض المواد القابلة للاشتعال للحريق.

ما لم يتم السماح بالتبديل الفوري لأي FRU الجاري استبداله بدون ضرورة اغلاق النظام، قم بتنفيذ ما يلي قبل ازالته. قم بايقاف تشغيل الحاسب ونزع كل أسلاك الطاقة من المخارج الكهربائية وقم أيضا بازالة حزمة البطارية ثم قم بفصل أي كابلات متصلة.

PERIGO

Antes de ligar o computador após a substituição da FRU, certifique-se de que todos os parafusos, molas e outras peças pequenas estejam no lugar e não estejam soltos dentro do computador. Verifique isso sacudindo o computador e procurando ouvir sons de peças soltas. Peças metálicas ou lascas de metal podem causar curto-circuito.

PERIGO

Algumas baterias reserva contêm uma pequena quantidade de níquel e cádmio. Não desmonte uma bateria reserva, recarregue-a, jogue-a no fogo ou na água, ou deixe-a entrar em curto-circuito. Descarte a bateria conforme requerido pelas leis ou regulamentos locais. Use somente a bateria nas partes listadas apropriadas. O uso de uma bateria incorreta pode resultar em combustão ou explosão da bateria.

PERIGO

O pacote da bateria contém uma pequena quantidade de níquel. Não o desmonte, jogue-o no fogo ou na água, ou deixe-o entrar em curto-circuito. Descarte o pacote da bateria conforme requerido pelas leis ou regulamentos locais. Use somente a bateria nas partes listadas apropriadas ao substituir o pacote da bateria. O uso de uma bateria incorreta pode resultar em combustão ou explosão da bateria.

PERIGO

A bateria de lítio pode causar incêndio, explosão ou graves queimaduras. Não a recarregue, remova seu conector polarizado, desmonte-a, aqueça-a acima de 100°C (212°F), incinere-a, ou exponha o conteúdo de sua célula à água. Descarte a bateria conforme requerido pelas leis ou regulamentos locais. Use somente a bateria nas partes listadas apropriadas. O uso de uma bateria incorreta pode resultar em combustão ou explosão da bateria.

PERIGO

Se o LCD quebrar e o fluido de dentro dele entrar em contato com seus olhos ou com suas mãos, lave as áreas afetadas imediatamente com água durante pelo menos 15 minutos. Procure cuidados médicos se algum sintoma causado pelo fluido surgir após a lavagem.

PERIGO

Para evitar choque elétrico, não remova a capa plástica que protege a parte inferior da placa inversora.

PERIGO

Embora as principais baterias possuam baixa voltagem, uma bateria em curto-circuito ou aterrada pode produzir corrente o bastante para queimar materiais de pessoal ou inflamáveis.

PERIGO

A menos que uma hot swap seja permitida para a FRU que está sendo substituída, faça o seguinte antes de removê-la: desligue o computador, desconecte todos os cabos de energia das tomadas, remova o pacote de baterias e desconecte quaisquer cabos de interconexão.

DANGER

Avant de remettre l'ordinateur sous tension après remplacement d'une unité en clientèle, vérifiez que tous les ressorts, vis et autres pièces sont bien en place et bien fixées. Pour ce faire, secouez l'unité et assurez-vous qu'aucun bruit suspect ne se produit. Des pièces métalliques ou des copeaux de métal pourraient causer un court-circuit.

DANGER

Certaines batteries de secours contiennent du nickel et du cadmium. Ne les démontez pas, ne les rechargez pas, ne les exposez ni au feu ni à l'eau. Ne les mettez pas en court-circuit. Pour les mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la pile de sauvegarde ou celle de l'horloge temps réel, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. Une batterie ou une pile inappropriée risque de prendre feu ou d'exploser.

DANGER

La batterie contient du nickel. Ne la démontez pas, ne l'exposez ni au feu ni à l'eau. Ne la mettez pas en court-circuit. Pour la mettre au rebut, conformez-vous à la réglementation en vigueur. Lorsque vous remplacez la batterie, veillez à n'utiliser que les modèles cités dans la liste de pièces détachées adéquate. En effet, une batterie inappropriée risque de prendre feu ou d'exploser.

DANGER

La pile de sauvegarde contient du lithium. Elle présente des risques d'incendie, d'explosion ou de brûlures graves. Ne la rechargez pas, ne retirez pas son connecteur polarisé et ne la démontez pas. Ne l'exposez pas à une temperature supérieure à 100°C, ne la faites pas brûler et n'en exposez pas le contenu à l'eau. Mettez la pile au rebut conformément à la réglementation en vigueur. Une pile inappropriée risque de prendre feu ou d'exploser.

DANGER

Si le panneau d'affichage à cristaux liquides se brise et que vous recevez dans les yeux ou sur les mains une partie du fluide, rincez-les abondamment pendant au moins quinze minutes. Consultez un médecin si des symptômes persistent après le lavage.

DANGER

Afin d'éviter tout risque de choc électrique, ne retirez pas le cache en plastique protégeant la partie inférieure de la carte d'alimentation.

DANGER

Bien que le voltage des batteries principales soit peu élevé, le court-circuit ou la mise à la masse d'une batterie peut produire suffisamment de courant pour brûler des matériaux combustibles ou causer des brûlures corporelles graves.

DANGER

Si le remplacement à chaud n'est pas autorisé pour l'unité remplaçable sur site que vous remplacez, procédez comme suit avant de retirer l'unité : mettez l'ordinateur hors tension, débranchez tous les cordons d'alimentation des prises de courant, retirez le bloc de batterie et déconnectez tous les câbles d'interconnexion.

VORSICHT

Bevor nach einem FRU-Austausch der Computer wieder angeschlossen wird, muß sichergestellt werden, daß keine Schrauben, Federn oder andere Kleinteile fehlen oder im Gehäuse vergessen wurden. Der Computer muß geschüttelt und auf Klappergeräusche geprüft werden. Metallteile oder-splitter können Kurzschlüsse erzeugen.

VORSICHT

Die Bereitschaftsbatterie, die sich unter dem Diskettenlaufwerk befindet, kann geringe Mengen Nickel und Cadmium enthalten. Sie darf nur durch die Verkaufsstelle oder den IBM Kundendienst ausgetauscht werden. Sie darf nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Die Batterie kann schwere Verbrennungen oder Verätzungen verursachen. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Bereitschafts-oder Systembatterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

VORSICHT

Akkus enthalten geringe Mengen von Nickel. Sie dürfen nicht zerlegt, wiederaufgeladen, kurzgeschlossen, oder Feuer oder Wasser ausgesetzt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

VORSICHT

Die Systembatterie ist eine Lithiumbatterie. Sie kann sich entzünden, explodieren oder schwere Verbrennungen hervorrufen. Batterien dieses Typs dürfen nicht aufgeladen, zerlegt, über 100°C erhitzt oder verbrannt werden. Auch darf ihr Inhalt nicht mit Wasser in Verbindung gebracht oder der zur richtigen Polung angebrachte Verbindungsstecker entfernt werden. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Beim Ersetzen der Batterie nur Batterien des Typs verwenden, der in der Ersatzteilliste aufgeführt ist. Der Einsatz falscher Batterien kann zu Entzündung oder Explosion führen.

VORSICHT

Die Leuchtstoffröhre im LCD-Bildschirm enthält Quecksilber. Bei der Entsorgung die örtlichen Bestimmungen für Sondermüll beachten. Der LCD-Bildschirm besteht aus Glas und kann zerbrechen, wenn er unsachgemäß behandelt wird oder der Computer auf den Boden fällt. Wenn der Bildschirm beschädigt ist und die darin befindliche Flüssigkeit in Kontakt mit Haut und Augen gerät, sollten die betroffenen Stellen mindestens 15 Minuten mit Wasser abgespült und bei Beschwerden anschließend ein Arzt aufgesucht werden.

VORSICHT

Aus Sicherheitsgründen die Kunststoffabdeckung, die den unteren Teil der Spannungswandlerplatine umgibt, nicht entfernen.

VORSICHT

Obwohl Hauptbatterien eine niedrige Spannung haben, können sie doch bei Kurzschluß oder Erdung genug Strom abgeben, um brennbare Materialien zu entzünden oder Verletzungen bei Personen hervorzurufen.

VORSICHT

Wenn ein Austausch der FRU bei laufendem Betrieb nicht erlaubt ist, gehen Sie beim Austausch der FRU wie folgt vor: Schalten Sie den Computer aus, ziehen Sie alle Netzkabel von den Netzsteckdosen ab, entfernen Sie den Akku und ziehen Sie alle miteinander verbundenen Kabel ab.

לפני הפעלת המחשב לאחר החלפת FRU יש לוודא שכל הברגים, הקפיצים, וחלקים קטנים אחרים נמצאים במקומם ואינם חופשיים לזוז בתוך המחשב. כדי לוודא זאת, יש לטלטל את המחשב ולהקשיב לגילוי קולות שקשוק. חלקי או שבבי מתכת עלולים לגרום לקצרים חשמליים.

סוללות המתנה מסוימות מכילות כמות קטנה של ניקל וקדמיום. אין לפרק סוללת המתנה, לטעון אותה מחדש, להשליך אותה לאש או למים או לקצר אותה. יש לסלק את הסוללה כנדרש על ידי התקנות והחוקים המקומיים. יש להשתמש רק בסוללה המופיעה ברשימת החלקים המתאימה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.

מארז הסוללה מכיל כמות קטנה של ניקל וקדמיום. אין לפרק את מארז הסוללה, להשליך אותו לאש או למים או לקצר אותו. יש לסלק את מארז הסוללה הסוללה כנדרש על ידי התקנות והחוקים המקומיים. יש להשתמש רק בסוללה המופיעה ברשימת החלקים המתאימה בזמן החלפת מארז הסוללה. שימוש בסוללה לא מתאימה עלול לגרום להצתה או התפוצצות של הסוללה.

סכנה

סוללת הליתיום עלולה לגרום לשריפה, להתפוצצות או לכוויות קשות. אין לטעון אותה מחדש, לסלק את המחבר המקוטב שלה, לפרק אותה או לחמם אותה לטמפרטורה העולה על 100 מעלות צלזיוס. אין לשרוף את הסוללה ואין לחשוף את תוכן התא למים. יש לסלק את הסוללה כנדרש בתקנות ובחוקים המקומיים. יש להשתמש רק בסוללה המופיעה ברשימת החלקים המתאימים. שימוש בסוללה אחרת עלול לגרום לסכנת שריפה או התפוצצות.

סכנה

אם מסך הגביש הנוזלי (LCD) נשבר והנוזל מתוך המסך בא במגע עם עיניכם או ידיכם, שטפו את האזורים הנגועים מיד במים במשך 15 דקות לפחות. פנו לקבלת עזרה רפואית אם תסמינים הנובעים מהמגע עם הנוזל נמשכים לאחר השטיפה.

סכנה

כדי למנוע התחשמלות, אין להסיר את מכסה הפלסטיק המגן על חלקו התחתון של הכרטיס ההפוך.

סכנה

אף שהסוללות הראשיות הן בעלות מתח נמוך, סוללה מקוצרת או מוארקת עלולה להפיק זרם מספיק לגרימת כוויות או להצתת חומרים דליקים.

סכנה

אלא אם כן מותרת ׳החלפה חמה׳ של ה-FRU המוחלף, פעלו כדלהלן לפני הסרתו:
כבו את המחשב, נתקו את כל כבלי החשמל מהשקעים, הוציאו את מארז הסוללות ונתקו את כל הכבלים המחוברים.

危険

FRU の交換後、 ThinkPad の電源を入れる前に、ねじ、バネ、その他の小さな部品がすべて正しい位置にあり、また ThinkPad の内部で緩んでいないことを確認してください。
これを確認するには、 ThinkPad を振って、カチャカチャと音がしないか確かめます。金属部品や金属破片はショートの原因になることがあります。

危険

予備バッテリーの中には少量のニッケルとカドミウムが含まれているものがあります。したがって、予備バッテリーの分解、再充電、火または水の中への投棄、またはショートさせることは決して行わないでください。バッテリーを廃棄する場合は地方自治体の条例に従ってください。適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

危険

バッテリー・パックには少量のニッケルが含まれています。バッテリー・パックを分解したり、火または水の中に投げ込んだり、ショートさせないでください。バッテリー・パックの廃棄にあたっては、地方自治体の条例または規則に従ってください。バッテリー・パックを交換するときは、適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

危険

リチウム・バッテリーは、火災、爆発、または重症のやけどを引き起こすことがあります。バックアップ・バッテリーの充電、その極性コネクターの取り外し、バッテリー本体の分解、
100 ℃ (212 ˚ F) 以上への加熱、焼却、電池の中身を水に浸すことはしないでください。バッテリーを廃棄する場合は地方自治体の条例に従ってください。適切なパーツ・リストにあるバッテリーだけを使用してください。誤ったバッテリーを使用すると、バッテリーが発火したり、爆発したりすることがあります。

危険

LCD が破損し、 LCD の中の液体が目に入ったり、手に触れたりした場合は、液体が触れた部分を少なくとも 15 分間洗い流してください。洗い流した後に、液体によって何らかの症状が現れた場合は、医師の治療を受けてください。

危険

感電を防ぐため、インバーター・カードの下部を保護しているプラスチック・カバーを外さないでください。

危険

メイン・バッテリーの電圧は低くても、ショートしたり、接地したバッテリーが、作業者にやけどを負わせたり、可燃物を燃やすだけの電流を発生させる場合があります。

危険

交換しようとしている FRU がホット・スワップに対応していない場合、それを取り外す前に、コンピューターの電源をオフにし、すべての電源コードをコンセントから抜き、バッテリー・パックを取り外して、相互接続しているケーブルをすべて切り離してください。

위험

FRU를 교체하고 나서 컴퓨터 전원을 켜기 전에 모든 나사, 스프링 및 기타 작은 부품들이 올바른 위치에 있는지, 컴퓨터 내부에 단단하게 연결되어 있는지 확인하십시오. 컴퓨터를 흔들어 달깍거리는 소리가 나지 않는지 확인하십시오. 금속 부품 또는 금속 조각은 누전을 일으킬 수 있습니다.

위험

일부 보조 배터리에는 소량의 니켈 및 카트뮴이 포함되어 있습니다. 보조 배터리를 분해하거나, 다시 충전하거나, 불 또는 물에 던지거나, 단락시키지 마십시오. 배터리 팩을 폐기할 때에는 해당 지역의 법률 규정을 따르십시오. 배터리 팩을 교체할 때에는 올바른 배터리만 사용하십시오. 올바르지 않은 배터리를 사용하면 배터리가 발화되거나 폭발할 수 있습니다.

위험

배터리 팩에는 소량의 니켈이 포함되어 있습니다. 배터리 팩을 분해하거나, 불 또는 물에 던지거나, 단락시키지 마십시오. 배터리 팩을 폐기할 때에는 해당 지역의 법률 규정을 따르십시오. 배터리 팩을 교체할 때에는 올바른 배터리만 사용하십시오. 올바르지 않은 배터리를 사용하면 배터리가 발화되거나 폭발할 수 있습니다.

위험

리튬 배터리는 화재, 폭발 또는 심각한 화상을 일으킬 수 있습니다. 리튬 배터리를 다시 충전하거나, 극성 커넥터를 제거하거나, 분해하거나, 100C(212F) 이상으로 가열하거나, 소각하거나, 전지 내용물을 물에 노출시키지 마십시오. 배터리를 폐기할 때에는 해당 지역을 법률 규정을 따르십시오. 올바른 배터리만 사용하십시오. 올바르지 않은 배터리를 사용하면 배터리가 발화되거나 폭발할 수 있습니다.

위험

LCD가 파손되어 LCD 내부의 액체가 눈에 들어가거나 손에 묻으면 즉시 깨끗한 물로 15분 이상 닦아 내십시오. 씻은 후에 조금이라도 이상을 느끼면 즉시 병원에 가서 의사의 진찰을 받아야 합니다.

위험

전기적 위험을 방지하려면 인버터 카드의 아래 부분을 보호하는 플라스틱 덮개를 제거하지 마십시오.

위험

기본 배터리의 전압은 낮지만, 단락되거나 접지된 배터리는 화상을 입히기에 충분한 전류와 가연성 물질을 발생시킬 수 있습니다.

위험

FRU 교체 시 Hot Swap이 지원되지 않는 경우, FRU를 제거하기 전에 컴퓨터의 전원을 끄고, 전기 콘센트에서 전원 코드를 분리하고, 배터리를 제거한 후, 연결된 모든 케이블을 분리하십시오.

PELIGRO

Antes de encender el sistema despues de sustituir una FRU, compruebe que todos los tornillos, muelles y demás piezas pequeñas se encuentran en su sitio y no se encuentran sueltas dentro del sistema. Compruébelo agitando el sistema y escuchando los posibles ruidos que provocarían. Las piezas metálicas pueden causar cortocircuitos eléctricos.

PELIGRO

Algunas baterías de reserva contienen una pequeña cantidad de níquel y cadmio. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

PELIGRO

Las baterías contienen pequeñas cantidades de níquel. No las desmonte, ni recargue, ni las eche al fuego o al agua ni las cortocircuite. Deséchelas tal como dispone la normativa local. Utilice sólo baterías que se encuentren en la lista de piezas al sustituir la batería. La utilización de una batería no apropiada puede provocar la ignición o explosión de la misma.

PELIGRO

La batería de repuesto es una batería de litio y puede provocar incendios, explosiones o quemaduras graves. No la recargue, ni quite el conector polarizado, ni la desmonte, ni caliente por encima de los 100°C (212°F), ni la incinere ni exponga el contenido de sus celdas al agua. Deséchela tal como dispone la normativa local.

PELIGRO

Si la LCD se rompe y el fluido de su interior entra en contacto con sus ojos o sus manos, lave inmediatamente las áreas afectadas con agua durante 15 minutos como mínimo. Obtenga atención medica si se presenta algún síntoma del fluido despues de lavarse.

PELIGRO

Para evitar descargas, no quite la cubierta de plástico que rodea la parte baja de la tarjeta invertida.

PELIGRO

Aunque las baterías principales tienen un voltaje bajo, una batería cortocircuitada o con contacto a tierra puede producir la corriente suficiente como para quemar material combustible o provocar quemaduras en el personal.

PELIGRO

Salvo que se permita el intercambio en caliente para la unidad sustituible localmente, realice lo siguiente antes de extraerla: apague el sistema, desconecte todos los cables de alimentación de las tomas de alimentación eléctrica, extraiga la batería y desconecte los cables de interconexión.

危險

完成 FRU 更換之後，在開啟電腦的電源之前，請確定所有螺絲、彈簧及其他小零件都已歸位，沒有遺留在電腦內部。
若要確認這一點，請搖晃電腦，聽聽看是否有卡嗒的聲響。
金屬零件或儀錶的火花會造成電線短路。

危險

部分備用電池含有微量的鎳和鎘。請勿拆開備用電池、再充電、丟入火或水中，或使其形成短路。請按照當地法令或規定來棄置電池。

僅限使用零件清單中的電池。使用不適當的電池會導致電池起火或爆炸。

危險

電池套件含有微量的鎳。請勿拆開電池套件、丟入火或水中，或使其形成短路。請按照當地法令或規定來棄置電池套件。

更換電池套件時，僅限使用零件清單中的電池。使用不適當的電池會導致電池起火或爆炸。

危險

鋰電池會導致起火、爆炸或嚴重燒傷。請勿再充電、拔除其電極接頭、拆開、加熱超過 **100°C (212°F)** 、焚燒，或讓電池組成物浸到水。請按照當地法令或規定來棄置電池。
僅限使用零件清單中的電池。使用不適當的電池會導致電池起火或爆炸。

危險

如果 LCD 破裂導致 LCD 流出的液體沾到您的眼睛或手，請立即以清水沖洗沾染部位至少 15 分鐘。如果在清洗後出現該液體所造成的任何症狀，請就醫治療。

危險

為避免電擊，請勿拆下轉換卡下面的塑膠護蓋。

危險

雖然主電池的電壓很低，但短路或接地電池所產生的電流，仍足以使人燒傷或使可燃物質起火。

危險

除非 FRU 允許以熱抽換來替換，否則請依下列方式將其移除：將電腦關機，拔除插座上所有電源線，移除電池包，並拔開任何交互連接的線材。

Laser compliance statement (multilingual translations)

The laser compliance statements in this section are provided in the following languages:

- English
- Arabic
- Brazilian Portuguese
- French
- German
- Hebrew
- Japanese
- Korean
- Spanish
- Traditional Chinese

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

تحذير:
عند تثبيت منتجات الليزر (مثل أقراص CD-ROM أو محركات تشغيل أقراص DVD أو أجهزة الألياف البصرية أو النواقل)، لاحظ ما يلي:

- **لا تقم بنزع الغطاء. قد ينتج عن نزع غطاء منتج ليزر التعرض لأشعة ليزر في منتهى الخطورة. لا توجد أجزاء يمكن صيانتها داخل الجهاز.**
- **قد ينتج عن استخدام مفاتيح أو تنفيذ عمليات ضبط أو اجراءات بطريقة مختلفة عما هو محدد هنا التعرض لأشعة ليزر في منتهى الخطورة.**

خطر

تحتوي بعض منتجات الليزر على صمام ثنائي ليزري مضمن من Class 3A أو Class 3B. لاحظ ما يلي.
توجد أشعة ليزر عند الفتح. لا تنظر للشعاع ولا تنظر بطريقة مباشرة باستخدام أدوات ضوئية وتجنب التعرض المباشر للشعاع.

CUIDADO:
Quando produtos a laser (como CD-ROMs, unidades de DVD, dispositivos de fibra ótica ou transmissores) estão instalados, observe o seguinte:

- **Não remova as tampas. A remoção das tampas do produto a laser pode resultar em exposição prejudicial à radiação de laser. Não há peças que permitam manutenção no interior do dispositivo.**
- **A utilização de controles ou ajustes ou a execução de procedimentos diferentes daqueles especificados aqui pode resultar em exposição perigosa à radiação.**

PERIGO

Algumas produtos a laser contêm um diodo de laser Classe 3A ou Classe 3B integrado. Observe o seguinte:

Radiação a laser quando aberta. Não olhe diretamente para o feixe a olho nu ou com instrumentos óticos e evite exposição direta ao feixe.

ATTENTION :
Si des produits laser (tels que des unités de CD, DVD, à fibre optique ou des émetteurs) sont installés, lisez les informations suivantes :

- **Ne retirez pas les carters. En ouvrant le produit laser, vous vous exposez au rayonnement dangereux du laser. Aucune pièce de l'unité n'est réparable.**
- **Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent manuel.**

DANGER

Certains produits à laser contiennent une diode à laser intégrée de classe 3A ou 3B. Prenez connaissance des informations suivantes.

Rayonnement laser lorsque le carter est ouvert. Evitez toute exposition directe au rayon laser. Evitez de regarder fixement le faisceau ou de l'observer à l'aide d'instruments optiques.

Vorsicht:
Bei der Installation von Lasergeräten (wie CD-ROM-Laufwerken, DVD-Laufwerken, Einheiten mit Lichtwellenleitertechnik oder Sendern) Folgendes beachten:

- **Die Abdeckungen nicht entfernen. Durch Entfernen der Abdeckungen des Lasergeräts können gefährliche Laserstrahlungen freigesetzt werden. Das Gerät enthält keine zu wartenden Teile.**
- **Werden Steuerelemente, Einstellungen oder Durchführungen von Prozeduren anders als hier angegeben verwendet, kann gefährliche Laserstrahlung auftreten.**

Gefahr

Einige Lasergeräte enthalten eine Laserdiode der Klasse 3A oder 3B. Beachten Sie Folgendes:

Laserstrahlung bei geöffneter Verkleidung. Nicht in den Strahl blicken. Keine Lupen oder Spiegel verwenden. Strahlungsbereich meiden.

זהירות:
כאשר מוצרי לייזר (כגון תקליטורים, כונני DVD, התקני סיבים אופטיים או משדרים) מותקנים, שימו לב להנחיות הבאות:

- **אל תסירו את הכיסויים. הסרת הכיסויים של מוצר הלייזר עלולה לגרום לחשיפה מסוכנת לקרינת לייזר. ההתקן אינם כוללים רכיבים להחלפה עצמית.**
- **שימוש בבקרות ובהתאמות שלא צוינו או ביצוע תהליכים שלא צוינו, יכולים לגרום לחשיפה מסוכנת לקרינה.**

סכנה

כמה ממוצרי הלייזר מכילים דיודת לייזר מובנית Class 3A או Class 3B. שימו לב לדברים שלהלן.
קיימת פליטת קרני לייזר כאשר המוצר פתוח. אל תביטו ישירות אל הקרן, אל תביטו אל הקרן ישירות דרך אמצעים אופטיים, והימנעו מחשיפה ישירה לקרן.

警告：
レーザー製品 (CD-ROM、DVD ドライブ、光ファイバー装置、または送信機など) を取り付ける場合には、以下のことに注意してください。

- カバーを外さないこと。カバーを取り外すと有害なレーザー光を浴びることがあります。この装置の内部には保守が可能な部品はありません。
- 本書で指定された内容以外の、お客様による整備、調整、または手順を行った場合、レーザー放射の危険があります。

危険

一部のレーザー製品には、クラス 3A またはクラス 3B のレーザー・ダイオードが組み込まれています。次の点に注意してください。

開けるとレーザー光が放射されます。光線を見つめたり、光学機械を使って直接見たり、光線を直接浴びることは避けてください。

경고:
레이저 제품(CD-ROM, DVD 드라이브, 광섬유 장치 또는 송신기)이 설치되어 있는 경우, 다음과 같은 취급 주의사항을 참고하십시오.

- **덮개를 제거하지 마십시오. 레이저 제품의 덮개를 제거하면 유해한 레이저 복사에 노출될 위험이 있습니다. 장치 내부에는 사용자가 수리할 수 있는 부분이 없습니다.**
- **본 내용에서 설명한 이외의 방법으로 드라이브를 조정하거나 제어 또는 작동하는 경우, 해로운 레이저 복사에 노출될 수 있습니다.**

위험

일부 레이저 제품은 임베디드 클래스 3A 또는 클래스 3B 레이저 다이오드가 포함되어 있습니다. 다음 주의사항을 유의하십시오.

드라이브의 덮개를 열면 전자파가 발생합니다. 광선 또는 광 장치를 직접 보거나 광선에 노출되지 않도록 주의하십시오.

PRECAUCIÓN:
Cuando haya instalados productos láser (por ejemplo, unidades de CD-ROM, unidades de DVD, dispositivos de fibra óptica o transmisores), tenga en cuenta lo siguiente:

- **No extraiga las cubiertas. La extracción de las cubiertas del producto láser podría producir una exposición a radiación láser peligrosa. No hay ninguna pieza dentro del dispositivo que pueda reparar.**
- **La utilización de controles, ajustes o la realización de procedimientos diferentes a los especificados puede dar como resultado una exposición peligrosa a radiaciones.**

PELIGRO

Algunos productos láser contienen un diodo láser de Clase 3A o Clase 3B incorporado. Tenga en cuenta lo siguiente.

Emite radiación láser cuando está abierto. No fije la vista en el rayo, no lo mire directamente con instrumentos ópticos y evite la exposición directa al rayo.

警告：
安裝雷射產品（如 CD-ROM、DVD 光碟機、光纖裝置或轉送器）時，請注意下列事項：

- **請勿卸下外蓋。卸下雷射產品的外蓋可能導致曝露於危險的雷射輻射。裝置內沒有可維修的零件。**
- **若不遵守本文規定的控制、調整或操作程序，可能會導致危險的輻射外洩。**

危險

某些雷射產品包含內嵌式 3A 類或 3B 類雷射二極體。這類光碟機的使用者應注意下列聲明。

在開啟光碟機時，會有雷射輻射。請勿直視光束或以光學儀器直接觀看光束，並避免直接暴露在光束中。

Chapter 2. Important service information

This chapter presents following important service information that applies to all machine types supported by this manual:

- "Strategy for replacing FRUs" on page 27
  - "Strategy for replacing a hard disk drive" on page 27
  - "Important notice for replacing a system board" on page 28
- "Important information about replacing RoHS compliant FRUs" on page 28

Important: BIOS and device driver fixes are customer-installable. The BIOS and device drivers are available at
http://consumersupport.lenovo.com/

Strategy for replacing FRUs

Before replacing parts:

Make sure that all software fixes, drivers, and BIOS downloads are installed before replacing any FRUs listed in this manual.

After a system board is replaced, ensure that the latest BIOS is loaded to the system board before completing the service action.

To download software fixes, drivers, and BIOS, do as follows:

1. Go to http://consumersupport.lenovo.com/.
2. Enter a serial number or select a product or use Lenovo smart downloading.
3. Select the **BIOS/Driver/Applications**.
4. Follow the directions on the screen and install the necessary software.

Use the following strategy to prevent unnecessary expense for replacing and servicing FRUs:

- **If you are instructed to replace a FRU but the replacement does not correct the problem, reinstall the original FRU before you continue**.
- Some computers have both a processor board and a system board. If you are instructed to replace either the processor board or the system board, and replacing one of them does not correct the problem, reinstall that board, and then replace the other one.
- If an adapter or a device consists of more than one FRU, any of the FRUs may be the cause of the error. Before replacing the adapter or device, remove the FRUs, one by one, to see if the symptoms change. Replace only the FRU that changed the symptoms.

Attention: The setup configuration on the computer you are servicing may have been customized. Running Automatic Configuration may alter the settings. Note the current configuration settings (using the View Configuration option); then, when service has been completed, verify that those settings remain in effect.

Strategy for replacing a hard disk drive

Always try to run a low-level format before replacing a hard disk drive (HDD). This will cause all customer data on the hard disk to be lost. Be sure that the customer has a current backup of the data before doing this task.

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Attention: The drive startup sequence in the computer you are servicing may have been changed. Be extremely careful during write operations such as copying, saving, or formatting. If you select an incorrect drive, data or programs can be overwritten.

Important notice for replacing a system board

Some components mounted on a system board are very sensitive. Improper handling of a system board can cause damage to those components, and may cause a system malfunction.

Attention: When handling a system board:

- Do not drop a system board or apply any excessive force to it.
- Avoid rough handling of any kind.
- Avoid bending a system board and hard pushing to prevent cracking at each BGA (Ball Grid Array) chipset.

Important information about replacing RoHS compliant FRUs

RoHS, The Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC) is a European Union legal requirement affecting the global electronics industry. RoHS requirements must be implemented on Lenovo products placed on the market after June 2006. Products on the market before June 2006 are not required to have RoHS compliant parts. If the original FRU parts are non-compliant, the replacement parts also can be non-compliant. That is, if the original FRU parts are RoHS compliant, the replacement part also must be RoHS compliant.

Note: RoHS and non-RoHS FRU part numbers with the same fit and function are identified by the unique FRU part numbers.

Lenovo plans to transit to RoHS compliance before the implementation date and expects its suppliers to be ready to meet Lenovo's requirements and schedule in the European Union. Products sold between 2005 and 2006 might contain some RoHS compliant FRUs. The following statement pertains to the products with RoHS compliant FRUs.

RoHS compliant FRUs have unique FRU part numbers. Before or after the RoHS implementation date, the failed RoHS compliant parts must be replaced with compliant parts and only the following FRUs can be used: identified as compliant in the *Hardware Maintenance Manual* or direct substitutions can be used.

- Compliant FRUs identified in *Hardware Maintenance Manual*
- Direct substitutions with different FRU part numbers automatically shipped by the distribution center at the time of order

For products shipped after June 2006

Current or original part	Replacement FRU
Must be RoHS	Must be RoHS

Chapter 3. General checkout

This chapter presents following information:

- “What to do first” on page 29
- “Power system checkout” on page 30

Before you go to the checkout guide, be sure to read the following important notes.

Important notes:

- **Only certified trained personnel should service the computer.**
- **Before replacing any FRU, read the entire page on removing and replacing FRUs.**
- **When you replace FRUs, use new nylon-coated screws.**
- **Be extremely careful during such write operations as copying, saving, or formatting.** Drives in the computer that you are servicing sequence might have been altered. If you select an incorrect drive, data or programs might be overwritten.
- **Replace a FRU only with another FRU of the correct model.** When you replace a FRU, make sure that the model of the machine and the FRU part number are correct by referring to the FRU parts list.
- **A FRU should not be replaced because of a single, unreproducible failure.** Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. Consider replacing a FRU only when a problem recurs. If you suspect that a FRU is defective, clear the error log and run the test again. If the error does not recur, do not replace the FRU.
- **Be careful not to replace a nondefective FRU.**

What to do first

When you do return a FRU, you must include the following information in the parts exchange form or parts return form that you attach to it:

1. Name and phone number of service technician
2. Date of service
3. Date on which the machine failed
4. Date of purchase
5. Procedure index and page number in which the failing FRU was detected
6. Failing FRU name and part number
7. Machine type, model number, and serial number
8. Customer's name and address

Note: During the warranty period, the customer may be responsible for repair costs if the computer damage was caused by misuse, accident, modification, unsuitable physical or operating environment, or improper maintenance by the customer. Following is a list of some common items that are not covered under warranty and some symptoms that might indicate that the system was subjected to stress beyond normal use.

Before checking problems with the computer, determine whether the damage is covered under the warranty by referring to the following list:

The following are not covered under warranty:

- LCD panel cracked from the application of excessive force or from being dropped
- Scratched (cosmetic) parts
- Distortion, deformation, or discoloration of the cosmetic parts
- Plastic parts, latches, pins, or connectors that have been cracked or broken by excessive force
- Damage caused by liquid spilled into the system
- Damage caused by the improper insertion of a PC Card or the installation of an incompatible card
- Improper disc insertion or use of an optical drive

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- Diskette drive damage caused by pressure on the diskette drive cover, foreign material in the drive, or the insertion of a diskette with multiple labels
- Damaged or bent diskette eject button
- Fuses blown by attachment of a nonsupported device
- Forgotten computer password (making the computer unusable)
- Sticky keys caused by spilling a liquid onto the keyboard
- Use of an incorrect ac power adapter on laptop products

The following symptoms might indicate damage caused by nonwarranted activities:
- Missing parts might be a symptom of unauthorized service or modification.
- If the spindle of a hard disk drive becomes noisy, it may have been subjected to excessive force, or dropped.

Power system checkout

To verify a symptom, do the following:
1. Turn off the computer.
2. Remove the battery pack.
3. Connect the ac power adapter.
4. Check that power is supplied when you turn on the computer.
5. Turn off the computer.
6. Disconnect the ac power adapter and install the charged battery pack.
7. Check that the battery pack supplies power when you turn on the computer.

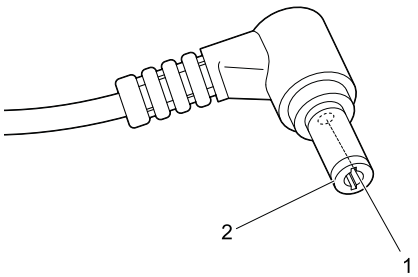
If you suspect a power problem, see the appropriate one of the following power supply checkouts:
- “Checking the ac power adapter” on page 30
- “Checking operational charging” on page 31
- “Checking the battery pack” on page 31

Checking the ac power adapter

You are here because the computer fails only when the ac power adapter is used.

- If the power-on indicator does not turn on, check the power cord of the ac power adapter for correct continuity and installation.
- If the computer does not charge during operation, go to “Checking operational charging” on page 31

To check the ac power adapter, do the following:
1. Unplug the ac power adapter cable from the computer.
2. Measure the output voltage at the plug of the ac power adapter cable. See the following figure:



Pin	Voltage (V dc)
1	+20
2	0

   Note: Output voltage of pin no.2 of the ac power adapter may different from the one you are servicing.
3. If the voltage is not correct, replace the ac power adapter.
4. If the voltage is acceptable, do the following:
   - Replace the system board.

- If the problem persists, go to Chapter 5 “Lenovo V570, B570, and B570e” on page 37.

Note: Noise from the ac power adapter does not always indicate a defect.

Checking operational charging

To check whether the battery charges properly during operation, use a discharged battery pack or a battery pack that has less than 50% of the total power remaining when installed in the computer.

Perform operational charging. If the battery status indicator or icon does not turn on, remove the battery pack and let it return to room temperature. Reinstall the battery pack. If the charge indicator or icon still does not turn on, replace the battery pack.

If the charge indicator still does not turn on, replace the system board. Then reinstall the battery pack. If it is still not charged, go to the next section.

Checking the battery pack

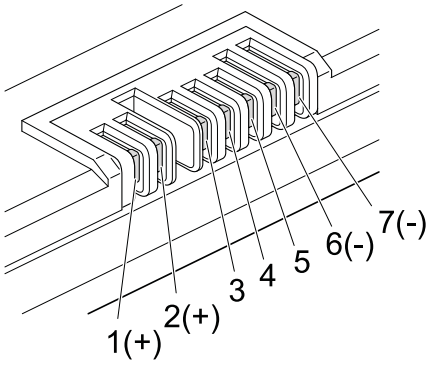
Battery charging does not start until the power meter shows that less than 95% of the total power remains; under this condition the battery pack can charge to 100% of its capacity. This protects the battery pack from being overcharged or from having a shortened life.

To check your battery, move your cursor to the power meter icon in the icon tray of the Windows taskbar and wait for a moment (but do not click it), and the percentage of battery power remaining is displayed. To get detailed information about the battery, double-click the power meter icon.

Note: If the battery pack becomes hot, it may not be able to be charged. Remove it from the computer and leave it at room temperature for a while. After it cools down, reinstall and recharge it.

To check the battery pack, do the following:

1. Power off the computer.
2. Remove the battery pack and measure the voltage between battery terminals 1 (+) and 7 (-). See the following figure:



Terminal	Voltage (V dc)
1	+ 0 to + 14
7	Ground (-)

3. If the voltage is less than +11.0 V dc, the battery pack has been discharged.

   Note: Recharging will take at least 3 hours, even if the indicator does not turn on.

   If the voltage is still less than +11.0 V dc after recharging, replace the battery.
4. If the voltage is more than +11.0 V dc, measure the resistance between battery terminals 5 and 7. The resistance must be 4 to 30 K Ω.

   If the resistance is not correct, replace the battery pack. If the resistance is correct, replace the system board.

Chapter 4. Related service information

This chapter presents following information:

- “Restoring the factory contents by using OneKey Recovery” on page 33
- “Passwords” on page 33
- “Power management” on page 34

Restoring the factory contents by using OneKey Recovery

Restore of factory default

The Lenovo computers come with pre-installed OneKey Rescue System. In order to save application files and the initial backup files of the system, the hard disk in a Lenovo computer includes a hidden partition when it is shipped. If you need to restore the system to the point of your first boot up, just enter Lenovo OneKey Rescue System and run **Restore to factory default**. For more information, refer to the help information system about the program.

Note: This will delete all the new data on the system partition (C drive), which is not recoverable. Be sure to back up your critical data before you perform this action.

Using recovery discs

When you replace a hard disk drive in your computer, you are unable to use the preinstalled Lenovo OneKey Recovery and OneKey Rescue. However, you can use the recovery discs that store your backup data to restore your new hard drive to a previous backup status.

Note: You can create recovery discs by burning the backup image to a CD/DVD as recovery discs. For more information, refer to the help information system about the program.

When you use the recovery discs to boot your computer, the system will enter the user interface of system recovery automatically. You will be prompted to insert the backup discs to complete the whole recovery process.

Note: The recovery process might take up to 2 hours.

Passwords

As many as two passwords might be needed for a Lenovo notebook computer: the power-on password, the hard disk password, and the supervisor password.

If any of these passwords has been set, a prompt for it will be displayed on the screen whenever the computer is turned on. The computer does not start until the password is entered.

Note: If only a supervisor password is set, the password prompt will not be displayed when the operating system is started.

Power-on password

A power-on password (POP) protects the system from being powered on by an unauthorized person. The password must be entered before an operating system can be booted.

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Supervisor password

A supervisor password (SVP) protects the system information stored in the BIOS. The user must enter the SVP in order to get access to the BIOS and change the system configuration.

Attention: If the SVP has been forgotten and cannot be made available to the service technician, there is no service procedure to reset the password. The system board must be replaced for a scheduled fee.

Power management

Note: Power management modes are not supported for APM operating system.

To reduce power consumption, the computer has three power management modes: screen blank, sleep (standby in Windows XP), and hibernation.

Screen blank mode

If the time set on the “Turn off monitor” timer in the operating system expires, the LCD backlight turns off. You also can turn off the LCD backlight by pressing Fn+F2.

To end screen blank mode and resume normal operation, press any key.

Sleep (standby) mode

When the computer enters sleep (standby) mode, the following events occur in addition to what occurs in screen blank mode:
- The LCD is powered off.
- The hard disk drive is powered off.
- The CPU stops.

To enter sleep (standby) mode, press Fn+F1.

In certain circumstances, the computer goes into sleep (standby) mode automatically:

- If a “suspend time” has been set on the timer, and the user does not do any operation with the keyboard, the hard disk drive, the parallel connector, or the diskette drive within that time.
- If the battery indicator blinks orange, indicating that the battery power is low.

To cause the computer to return from sleep (standby) mode and resume the operation, do one of the following:
- Press the Fn key.
- Open the LCD cover.
- Turn on the power button.

Also, when the time set on the resume timer elapses, the computer automatically returns from sleep (standby) mode and resumes operation.

Note: The computer does not accept any input immediately after it enters sleep (standby) mode. Wait a few seconds before taking any action to reenter operation mode.

Hibernation mode

In hibernation mode, the following occurs:

- The system status, RAM, VRAM, and setup data are stored on the hard disk drive.
- The system is powered off.

If you have defined one of the following actions as the event that causes the system to go into hibernation mode, perform that action.

- Closing the lid.
- Pressing the power button.

Also, the computer goes into hibernation mode automatically in either of the following conditions:

- If a “hibernation time” has been set on the timer, and if the user does not do any operation with the keyboard, the hard disk drive, the parallel connector, or the diskette drive within that time.
- If the timer conditions are satisfied in suspend mode.

When the power is turned on, the computer returns from hibernation mode and resumes operation. The hibernation file in the boot record on the hard disk drive is read, and system status is restored from the hard disk drive.

Chapter 5. Lenovo V570, B570, and B570e

This chapter presents the following product-specific service references and parts information:

- “Specifications” on page 37
- “Status indicators” on page 39
- “Fn key combinations” on page 40

Specifications

This topic presents the physical specifications of the computer.

Table 1. Specifications

Feature	Description
Processor	Intel Huron River SV
Core Chipset	Intel HM65
Bus architecture	• DDR3: 800, 1066, 1333MT/s for Dual Core CPU • DDR3: 800, 1066, 1333, 1600MT/s for Quad Core CPU • DMI X4, 2.5Gb/s • FDI 8 lanes (2 channels), 2.7Gt/s • PCI Express
Graphic Chipset	• Intel Integrated • NV n12p-GE (V570) • NV N12M-GS (B570/B570e)
Display	15.6 HD LED Panel, High glossy Wedge type, 1366x768 pixels, 220 nit
Standard memory	• DDR3 1066/1333 SODIMM (x2), Support Dual Channel • DDR3 1333 SODIMM (x1) (Select models only)
CMOS RAM	256 bytes
Hard disk drive	• 2.5" SATA 320/500GB/1TB (5400rpm) • 2.5" SATA 320/500/750GB/1TB (7200rpm) • SSD HDD (V570 or B570/B570e) (Select models only)
Optical drive	12.7mm Tray Rambo/BlueRay (Select models only)
I/O port	• External monitor connector • Stereo headphone jack • Microphone jack • RJ45 x 1 • HDMI port (Select models only) • USB 2.0 x 3 + USB2.0&e-SATA COMBO x 1 (Select models only) • 6-in-1 memory card reader

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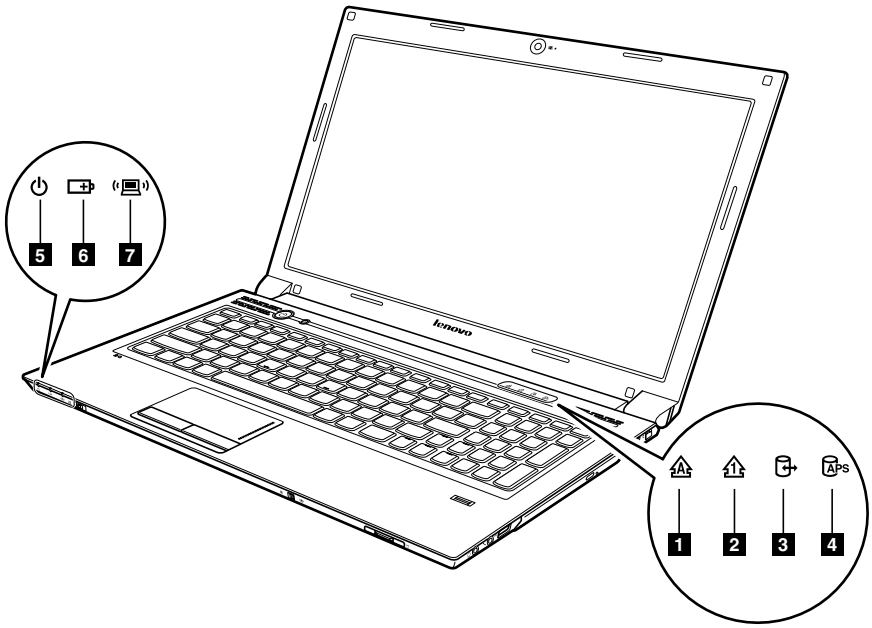
Table 1. Specifications (continued)

Feature	Description
Audio	• 1/8" Stereo Headphone Output Jack • 1/8" Microphone Input Combo Jack • Built-in stereo speakers • Built-in microphone
Video	CRT port x 1, HDMI port x 1(Select models only)
Ethernet (on the system board)	10/100/1000M Ethernet
PCI Express Mini Card slot	• 1 slot for WLAN card (half size) • 1 slot for WWAN (B570/B570e) (Select models only)
WLAN	• Intel 802.11 a/b/g/n & WiMax combo • Broadcom/Atheros b/g/n
Bluetooth wireless	• BT2.1 + EDR CyberTan/USI module • Built-in antenna with min-USB interface (Select models only)
Keyboard	Numberic Keyboard (Select models only)
Touch pad	• Two clicks with Rubber-Dome (V570) • Two clicks with Metal-Dome (B570/B570e)
Fingerprint reader (V570/ B570)	Egistec ES603-WB (Select models only)
Integrated camera	• 2.0M pixies (V570) • 0.3M pixies (B570/B570e) (Select models only)
Battery	48 WH, 6 cell cylindrical Li-ion Battery
ac power adapter	65 W/90 W
Pre-installed operating system	• Windows 7 Starter/Home Basic/Premium/Professional • Free DOS

Status indicators

This chapter presents the system status indicators that show the status of the computer.

For Lenovo V570 models:



For Lenovo B570 and B570e models:

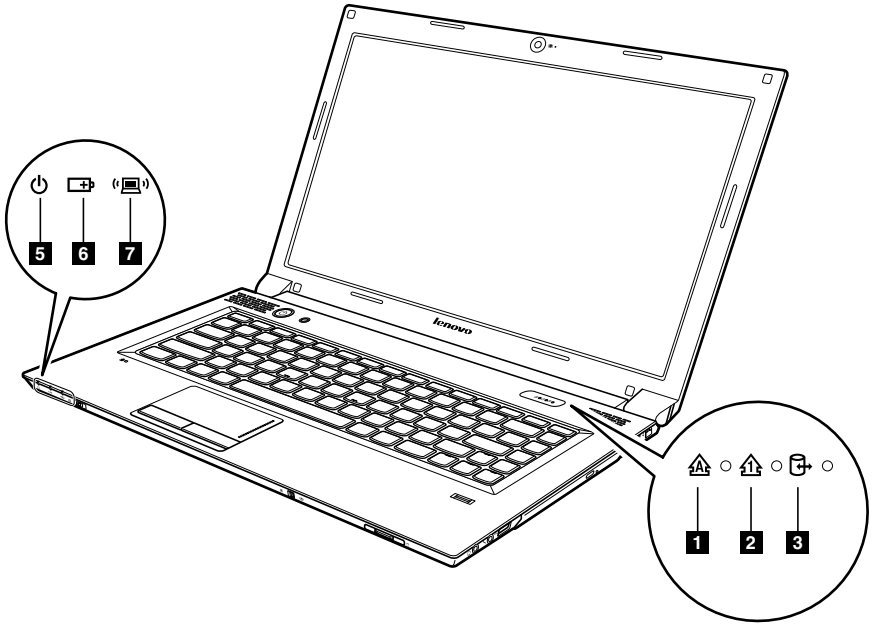


Table 2. Status indicators

Indicator	Meaning
1 Caps lock	**White:** Caps Lock mode is enabled. You can enter all alphabetic characters (A-Z) in uppercase without pressing the Shift key. To enable or disable Caps Lock mode, press the caps lock key (CapsLk).
2 Numeric lock	**White:** The separate numeric keypad on the keyboard is enabled. To enable or disable the numeric keypad, press the numeric lock key (NmLk).
3 Drive in use	**White:** Data is being read from or written to the hard disk drive, or the optical disk drive. When this indicator is on, do not put the computer into sleep (standby) mode or turn off the computer. **Note:** Do not move the system while the white drive-in-use light is on. Sudden physical shock could cause drive errors.
4 Active Protection System (APS)	• **White:** Active Protection System is enabled. • **Off:** Active Protection System is disabled.
5 Power on	• **White:** System is enabled. • **Blinking white:** System is in sleep (standby) mode. • **Off:** System is in hibernate mode or shut down.
6 Battery status	• **Blinking orange (500ms off/1s on):** The remaining power of the battery is less than 5% of its capacity. • **Blinking orange (100ms off/3.2s on):** The battery is being charged with the remaining power between 5% and 20% of its capacity. • **Orange:** The computer is operating on battery power with the remaining power between 5% and 20% of its capacity. • **Blinking white** The battery is being charged with the remaining power between 20% and 80% of its capacity. • **Off:** The remaining power of the battery is more than 80% of its capacity, or the computer is operating on battery power with the remaining power between 20% and 80% of its capacity.
7 Wireless status	• **White:** Any one of the wireless devices is enabled. • **Off:** All the wireless devices are disabled.

Fn key combinations

The following table shows the function of each combination of Fn with a function key.

Table 3. Function key combinations

Key combination	Description
Fn+Esc	Turn on or turn off the integrated camera.
Fn+F1	Put your computer into sleep (standby) mode. To return to normal operation, press any key.
Fn+F2	Enable or disable the backlight feature of the computer screen.

Table 3. Function key combinations (continued)

Key combination	Description
Fn+F3	Switch between the computer display and an external monitor.
Fn+F4	Configure the computer display resolution.
Fn+F5	Enable or disable the built-in wireless networking features.
Fn+F6	Enable or disable the touch pad.
Fn+F9	Start or pause playback of Windows Media Player.
Fn+F10	Stop playback of Windows Media Player.
Fn+F11	Skip to the previous track.
Fn+F12	Skip to the next track.
Fn+Insert	Enable/Disable the scroll lock.
Fn+PrtSc	Activate the system request.
Fn+Home	Activate the pause function.
Fn+End	Activate the break function.
Fn + up/down arrow	Increase or decrease the display brightness level.
Fn + left/right arrow	Increase or decrease the sound volume.

Chapter 6. FRU replacement notices

This chapter presents notices related to removing and replacing parts. Read this chapter carefully before replacing any FRU.

External CRU statement to customers:
Some problems with your product can be resolved with a replacement part you can install yourself, called a “Customer Replaceable Unit” or “CRU.” Some CRUs are designated as Self-service CRUs and others are designated as Optional-service CRUs. *Installation of Self-service CRUs is your responsibility; you may request that Lenovo installs an Optional-service CRU according to the warranty service for your product.* Where you are installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You may find a list of CRUs in the publications that ship with your product or at http://www.lenovo.com/CRUs. You may be required to return the defective part that is replaced by the CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you may be charged for the replacement CRU if Lenovo does not receive the defective part within thirty (30) days of your receipt of the replacement CRU. See your Lenovo Limited Warranty documentation for full details.

Screw notices

Loose screws can cause a reliability problem. In the Lenovo notebook computer, this problem is addressed with special nylon-coated screws that have the following characteristics:

- They maintain tight connections.
- They do not easily come loose, even with shock or vibration.
- They are harder to tighten.
- Each one should be used only once.

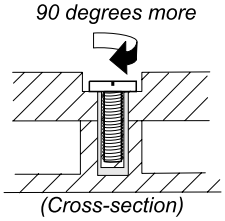
Do the following when you service this machine:

- Keep the screw kit in your tool bag.
- Always use new screws.
- Use a torque screwdriver if you have one.

Tighten screws as follows:

- **Plastic to plastic**

  Turn an additional **90 degrees** after the screw head touches the surface of the plastic part:



- **Logic card to plastic**

  Turn an additional **180 degrees** after the screw head touches the surface of the logic card:

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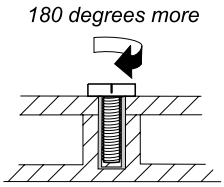

- **Torque driver**

  If you have a torque driver, refer to the “Torque” column for each step.
- Make sure that you use the correct screw. If you have a torque screwdriver, tighten all screws firmly to the torque shown in the table. **Never use a screw that you removed. Use a new one. Make sure that all of the screws are tightened firmly.**
- Ensure torque screw drivers are calibrated correctly following country specifications.

Chapter 7. Removing and replacing a FRU

This chapter presents directions and drawings for use in removing and replacing a FRU. Be sure to observe the following general rules:

1. Do not try to service any computer unless you have been trained and certified. An untrained person runs the risk of damaging parts.
2. Before replacing any FRU, review Chapter 6 “FRU replacement notices” on page 43.
3. Begin by removing any FRUs that have to be removed before replacing the failed FRU. Such FRUs are listed in each FRU replacement section. Remove them in the order in which they are listed.
4. Follow the correct sequence in the steps for removing a FRU, as given in the drawings by the numbers in square callouts.
5. When turning a screw to replace a FRU, turn it in the direction as given by the arrow in the drawing.
6. When removing a FRU, move it in the direction as given by the arrow in the drawing.
7. To put the new FRU in place, reverse the removal procedure and follow any notes that pertain to replacement. For information about connecting and arranging internal cables, see Chapter 8 “Locations” on page 73.
8. When replacing a FRU, use the correct screw(s) as shown in the procedures.

DANGER

Before removing any FRU, turn off the computer, unplug all power cords from electrical outlets, remove the battery pack, and then disconnect any interconnecting cables.

Attention: After replacing a FRU, do not turn on the computer until you have made sure that all screws, springs, and other small parts are in place and none are loose inside the computer. Verify this by shaking the computer gently and listening for rattling sounds. Metallic parts or metal flakes can cause electrical short circuits.

Attention: The system board is sensitive to, and can be damaged by, electrostatic discharge. Before touching it, establish personal grounding by touching a ground point with one hand or by using an electrostatic discharge (ESD) strap (P/N 6405959).

External CRU statement to customers:
Some problems with your product can be resolved with a replacement part you can install yourself, called a “Customer Replaceable Unit” or “CRU.” Some CRUs are designated as Self-service CRUs and others are designated as Optional-service CRUs. *Installation of Self-service CRUs is your responsibility; you may request that Lenovo installs an Optional-service CRU according to the warranty service for your product.* Where you are installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You may find a list of CRUs in the publications that ship with your product or at http://www.lenovo.com/CRUs. You may be required to return the defective part that is replaced by the CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you may be charged for the replacement CRU if Lenovo does not receive the defective part within thirty (30) days of your receipt of the replacement CRU. See your Lenovo Limited Warranty documentation for full details.

Note: The illustrations used in this chapter are of the Lenovo V570, unless otherwise stated. Your computer may look slightly different from the illustrations.

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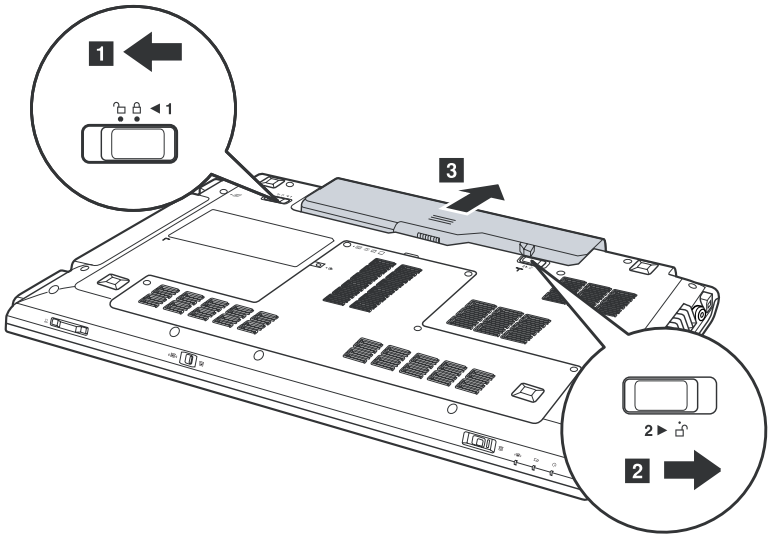
1010 Battery pack

Removal steps of battery pack

DANGER

Use only the battery specified in the parts list for your computer. Any other battery could ignite or explode.

Unlock the battery latch 1. Holding the battery lock lever in the unlocked position 2, remove the battery pack in the direction shown by the arrow 3.



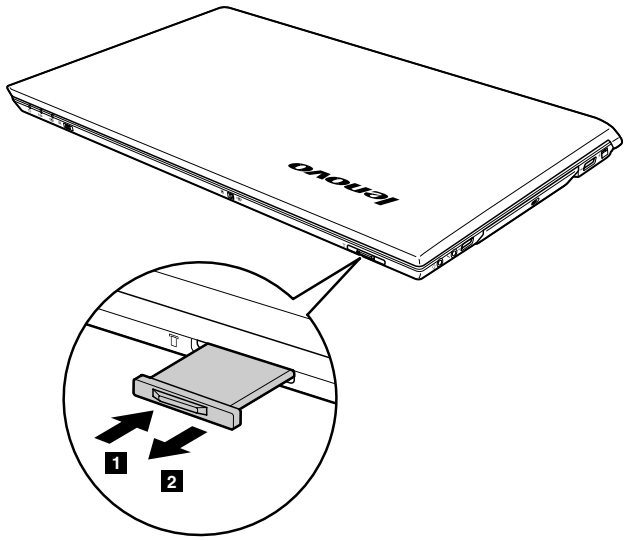
When installing: Install the battery pack in the slot. Make sure that the battery latch is in the locked position.

1020 Dummy card

For access, remove this FRU:
- “1010 Battery pack” on page 46

Removal steps of dummy cards

Remove the dummy card in the direction shown by the arrows 1 and 2.

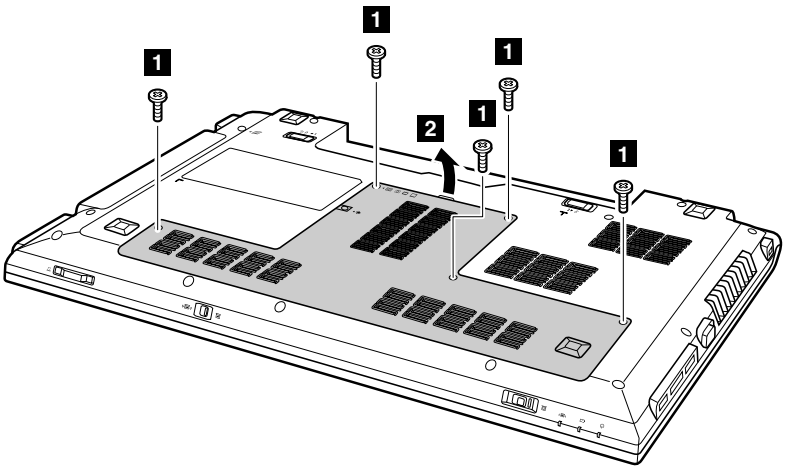


1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover

For access, remove this FRU:
- “1010 Battery pack” on page 46

Removal steps of hard disk drive/memory module/Mini PCI Express Card slot compartment cover

Note: Loosen the screws 1, then remove the compartment cover 2.



Step	Screw (quantity)	Color	Torque
1	M2.5 × 4.7 mm, flat-head, nylon-coated (5)	Black	1.5 kgfcm

1040 Hard disk drive

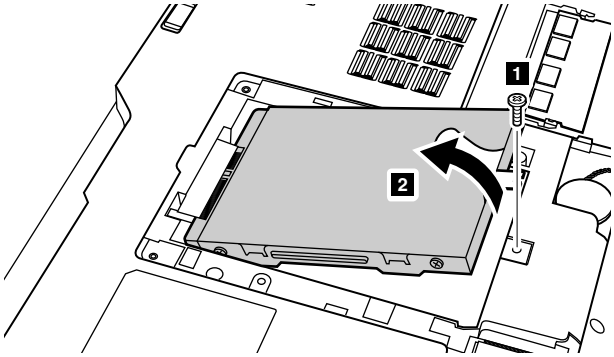
For access, remove these FRUs in order:
- “1010 Battery pack” on page 46
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47

Attention:

- Do not drop the drive or apply any physical shock to it. The drive is sensitive to physical shock. Improper handling can cause damage and permanent loss of data.
- Before removing the drive, have the user make a backup copy of all the information on it if possible.
- Never remove the drive while the computer is operating or is in suspend mode.

Removal steps of hard disk drive

Remove the screw **1**, and pull the tab in the direction shown by the arrow **2** to remove the hard disk drive from the slot.



Step	Screw (quantity)	Color	Torque
1	M2 × 3 mm, flat-head, nylon-coated (1)	White	1.5 kgfcm

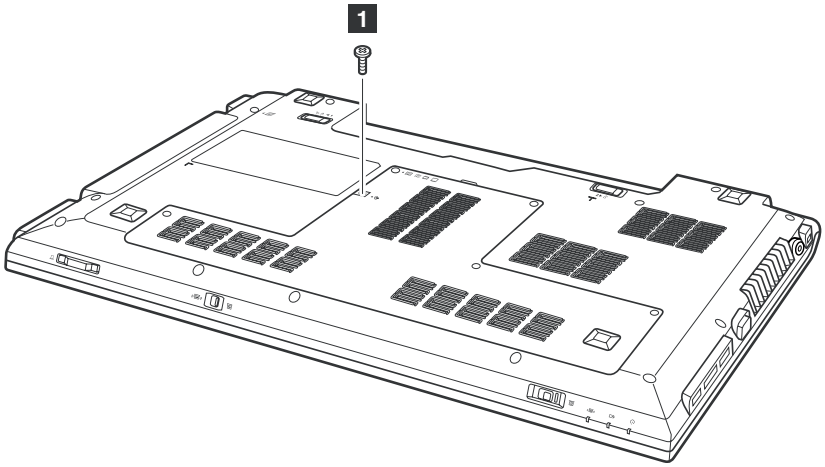
When installing: Make sure the HDD connector is attached firmly.

1050 Optical drive

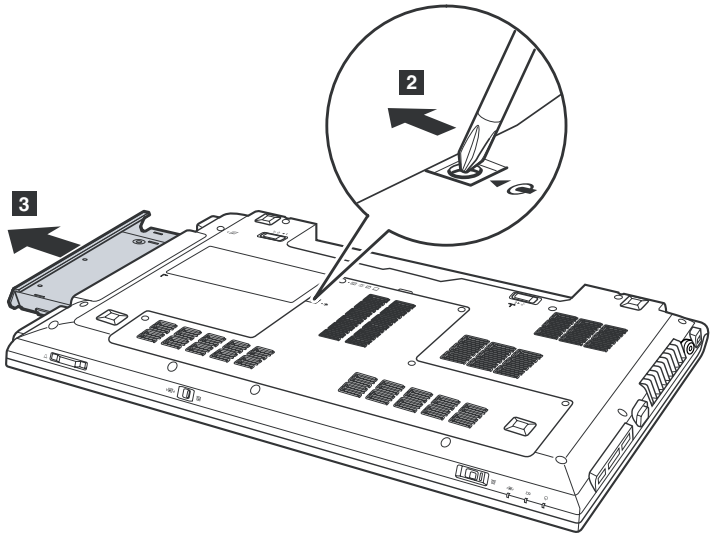
For access, remove this FRU:
- “1010 Battery pack” on page 46

Removal steps of optical drive

Remove the screw 1, insert a screwdriver into the screw hole and push the optical drive in the direction shown by the arrow 2. Pull the optical drive out in the direction shown by the arrow 3.



Step	Screw (quantity)	Color	Torque
1	M2 × 3 mm, flat-head, nylon-coated (1)	Black	1.5 kgfcm

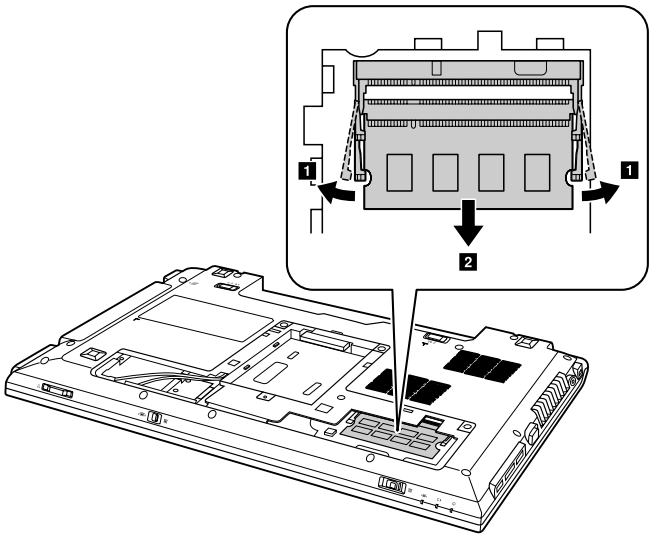


1060 Memory module

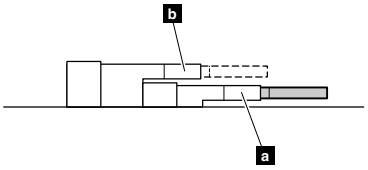
For access, remove these FRUs in order:
- “1010 Battery pack” on page 46
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47

Removal steps of memory module

Release the two latches on both edges of the socket at the same time in the direction shown by the arrows **1**, and then unplug the DIMM in the direction shown by the arrow **2**.



Note: If only one memory module is used on the computer you are servicing, the card must be installed in SLOT-0 (**a**: lower slot), but not in SLOT-1 (**b**: upper slot).

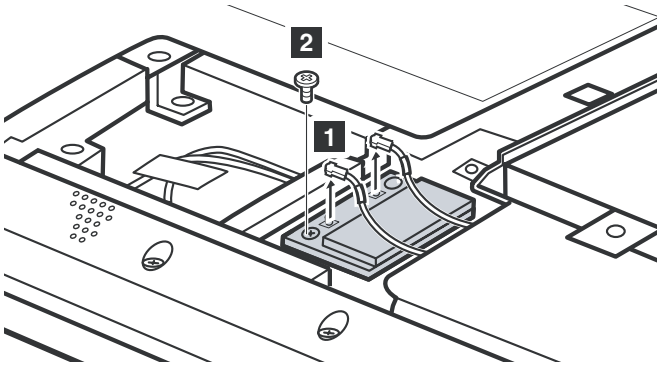


When installing: Insert the notched end of the memory module into the socket. Press the memory module firmly, and pivot it until it snaps into place. Make sure that it is firmly installed in the slot and does not move easily.

1070 PCI Express Mini Card for wireless LAN/WAN

For access, remove these FRUs in order:
- “1010 Battery pack” on page 46
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47

Removal steps of PCI Express Mini Card for wireless LAN/WAN



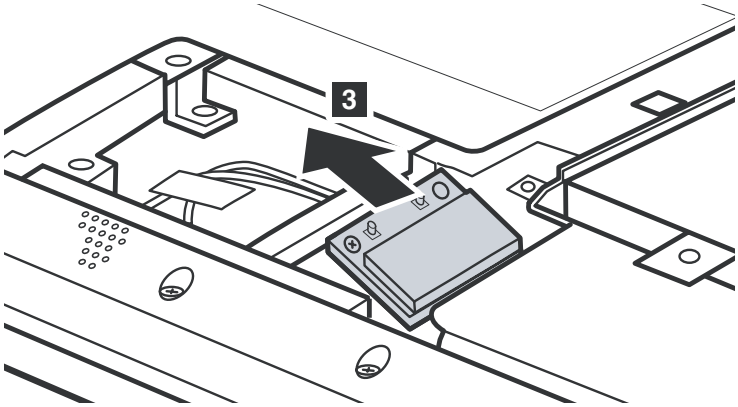
Disconnect the two wireless LAN cables (black, white) 1 , and then remove the screw 2.

In step 1, unplug the jacks by using the removal tool antenna RF connector (P/N: 08K7159) or pick the connectors with your fingers and gently unplug them in the direction of the arrows.

Note: Wireless LAN card has 2 cables in step 1.
Wireless LAN card in some models may have 3 cables in step 1.

Step	Screw (quantity)	Color	Torque
2	M2 × 3 mm, flat-head, nylon-coated (1)	Black	1.5 kgfcm

Remove the card in the direction shown by the arrow **3**.



When installing:

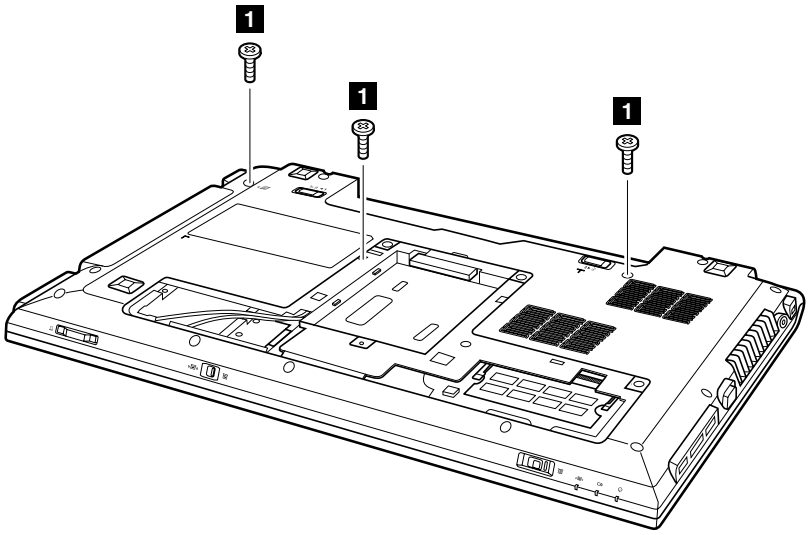
- In models with a wireless LAN card that has two antenna connectors, plug the black cable (1st) (MAIN) into the jack labeled **1**, and the white cable (2nd) (AUX) into jack labeled **2** on the card.
- In models with a wireless LAN card that has three antenna connectors, plug the black cable (1st) (MAIN) into the jack labeled **1**, the grey cable (3rd) into jack labeled **3**, and the white cable (2nd) (AUX) into jack labeled **2** on the card.

1080 Keyboard

For access, remove this FRU:
- “1010 Battery pack” on page 46
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47

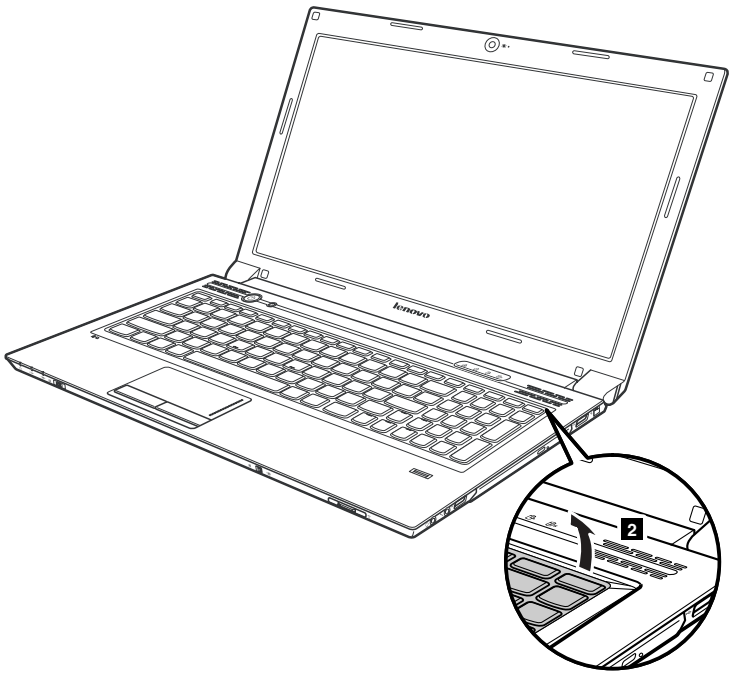
Removal steps of keyboard

Remove the screws 1.

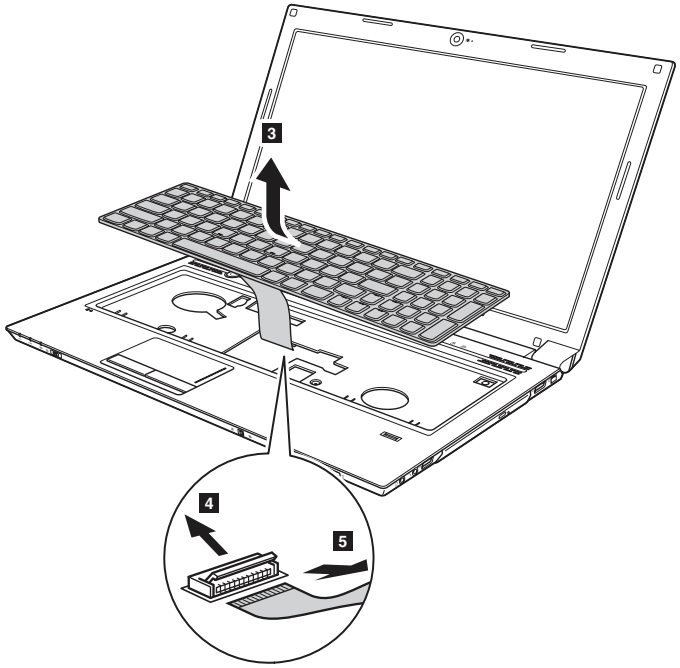


Step	Screw (quantity)	Color	Torque
1	M2.5 × 8 mm, flat-head, nylon-coated (3)	Black	2.5 kgfcm

Loosen the keyboard with fingers in the direction shown by the arrow 2.



Lift the keyboard a little 3, and then detach the connector in the direction shown by the arrows 4 and 5.



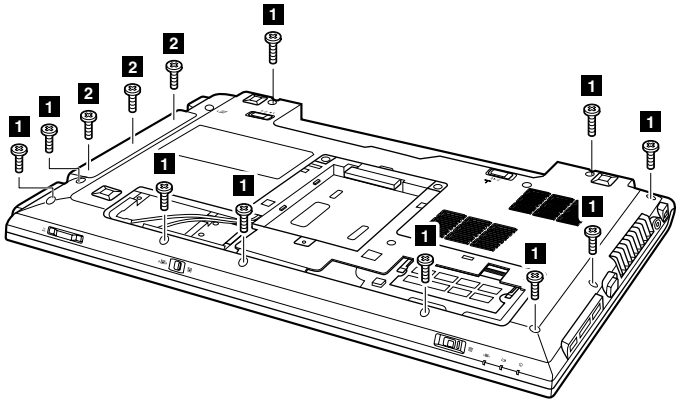
When installing: Make sure that the FPC connector is attached firmly.

1090 Keyboard bezel

For access, remove these FRUs in order:
- “1010 Battery pack” on page 46
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1050 Optical drive” on page 49
- “1080 Keyboard” on page 53

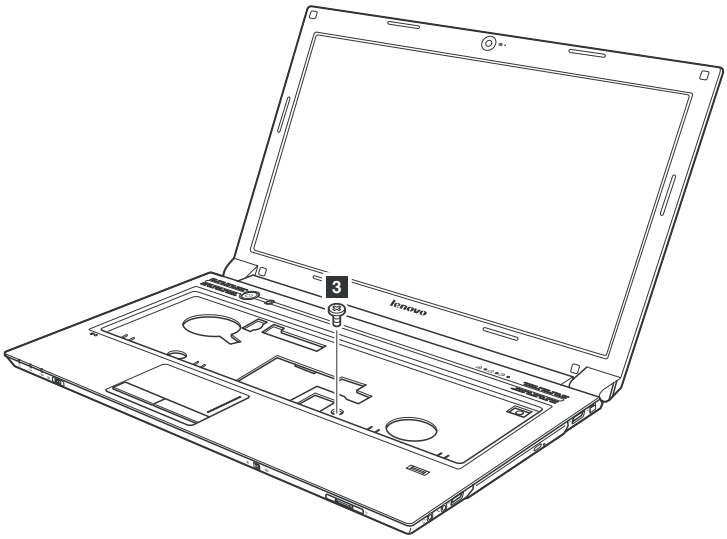
Removal steps of keyboard bezel

Remove the screws 1 and 2 on the bottom.



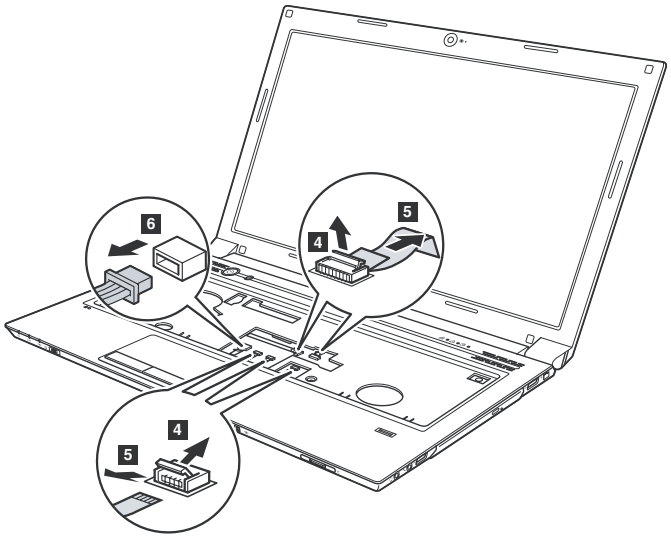
Step	Screw (quantity)	Color	Torque
1	M2.5 × 8 mm, flat-head, nylon-coated (10)	Black	2.5 kgfcm
2	M2 × 2.5 mm, flat-head, nylon-coated (3)	White	1.5 kgfcm

Remove the screw 3.



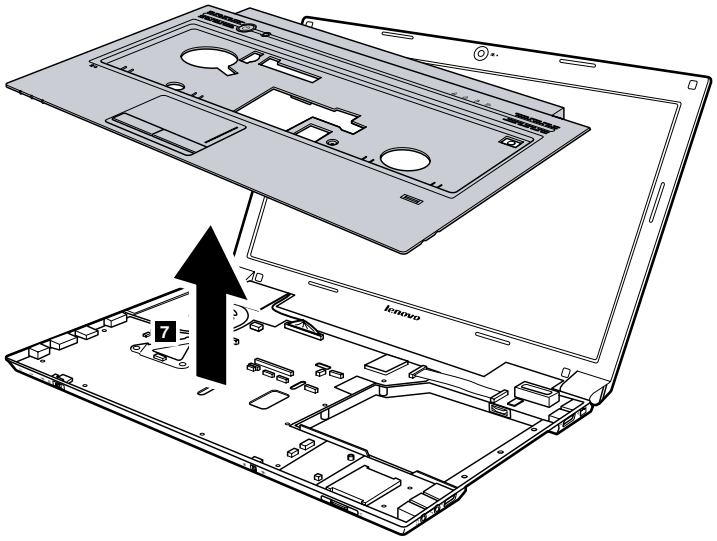
Step	Screw (quantity)	Color	Torque
3	M2 × 6 mm, flat-head, nylon-coated (1)	Black	2.5 kgfcm

Detach five FPC connectors in the direction shown by the arrows 4 5. Unplug the microphone connector in the direction shown by arrow 6.

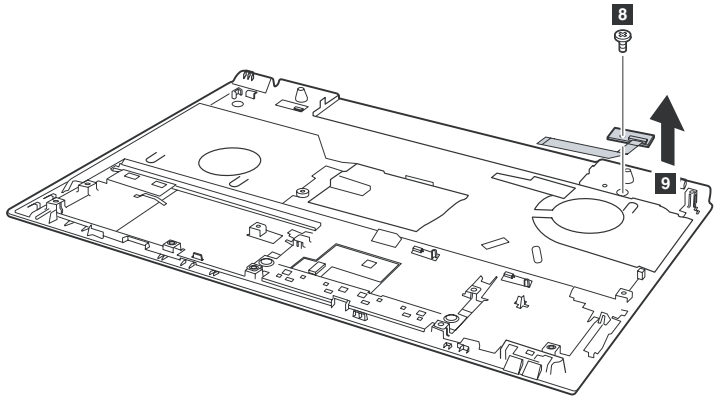


When installing: Make sure that all the FPC connectors, microphone connectors and LCD connector are attached firmly.

Remove the keyboard bezel in the direction shown by the arrow 7.



Remove the screw 8 and then remove the power board 9.



Step	Screw (quantity)	Color	Torque
9	M2 × 3.5 mm, flat-head, nylon-coated (1)	Black	2.5 kgfcm

1100 System board assembly

Important notices for handling the system board:

When handling the system board, bear the following in mind.

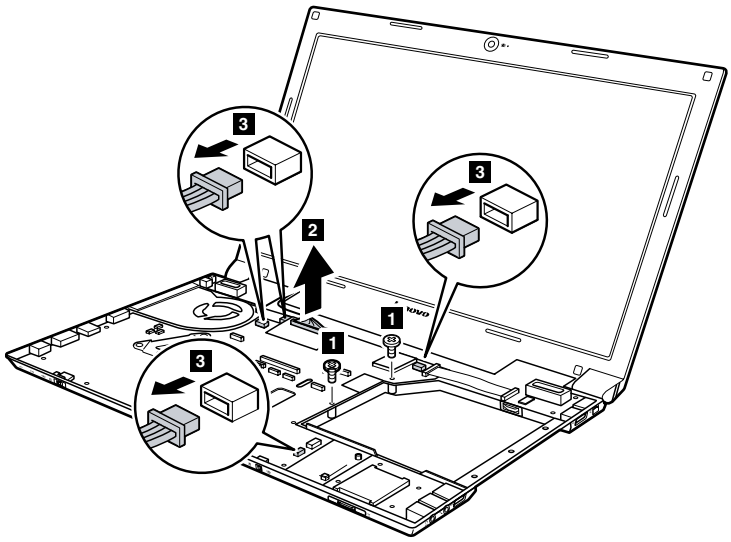
- Be careful not to drop the system board on a bench top that has a hard surface, such as metal, wood, or composite.
- Avoid rough handling of any kind.
- At every point in the process, be sure not to drop or stack the system board.
- If you put a system board down, be sure to put it only on a padded surface such as an ESD mat or a corrugated conductive surface.

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54

Removal steps of system board

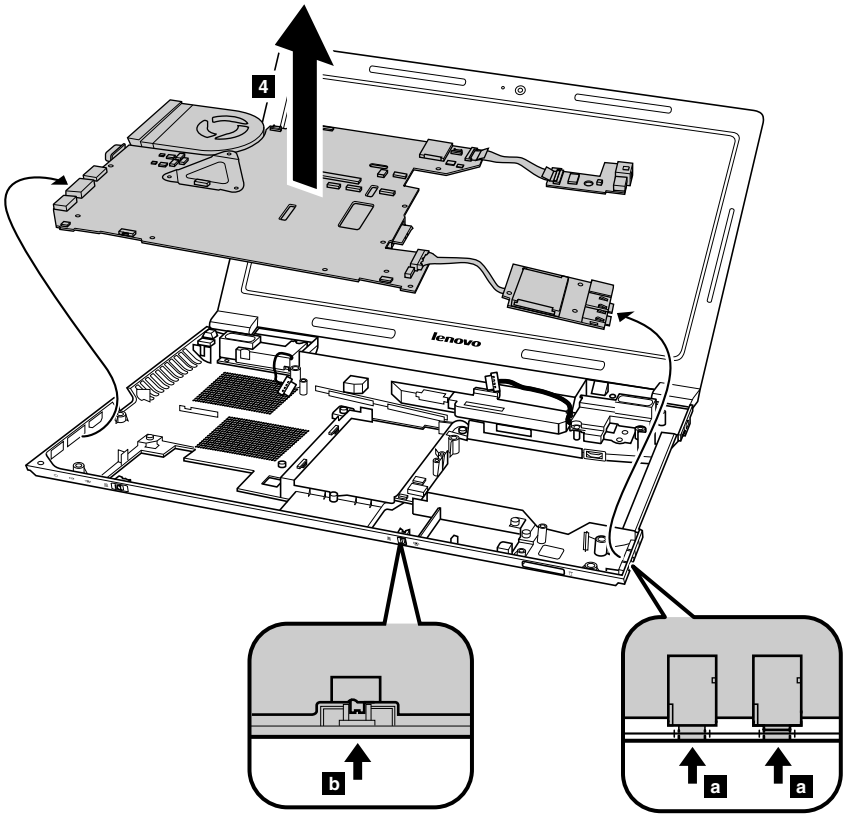
Remove the screws 1. Unplug the LCD connector in the direction shown by the arrow 2, and four microphone connectors in the direction shown by the arrow 3.



Step	Screw (quantity)	Color	Torque
1	M2 × 6 mm, flat-head, nylon-coated (2)	Black	2.5 kgfcm

When installing: Make sure that all the connectors are attached firmly.

Remove the system board in the direction shown by the arrow **4**.



When installing: When attaching the system board to the base cover, adjust the placement of the wireless radio switch as shown in **b**, and make sure that both of the audio jack and the microphone jack are attached to the holes on the base cover as shown in **a**. Improper placement of the switch or those jacks might cause a damage.

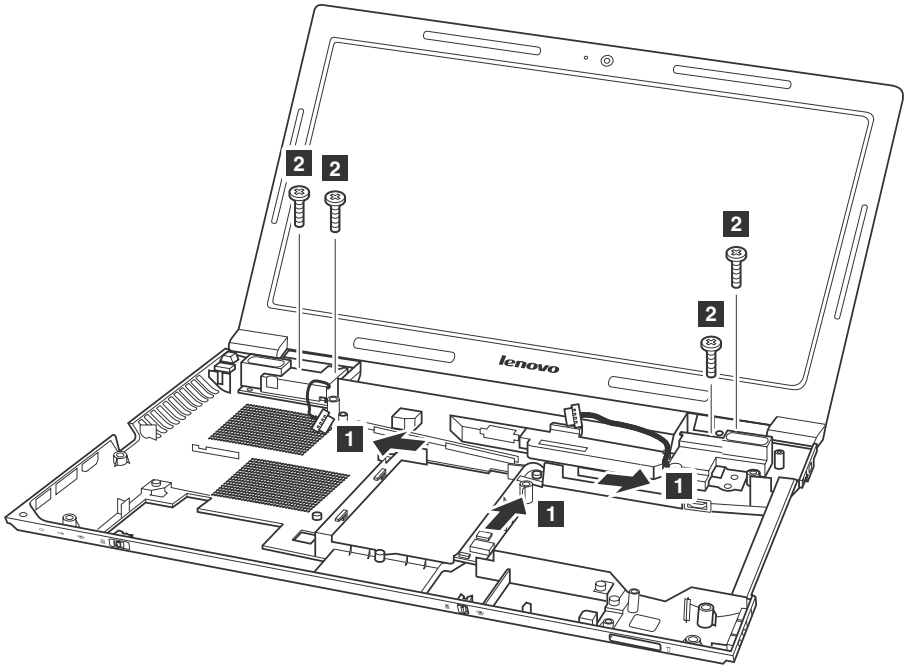
1110 LCD unit

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1100 System board assembly” on page 56

Removal steps of LCD unit

Release the antenna cables from the cable guides in the direction shown by the arrows 1. Remove the screws 2.

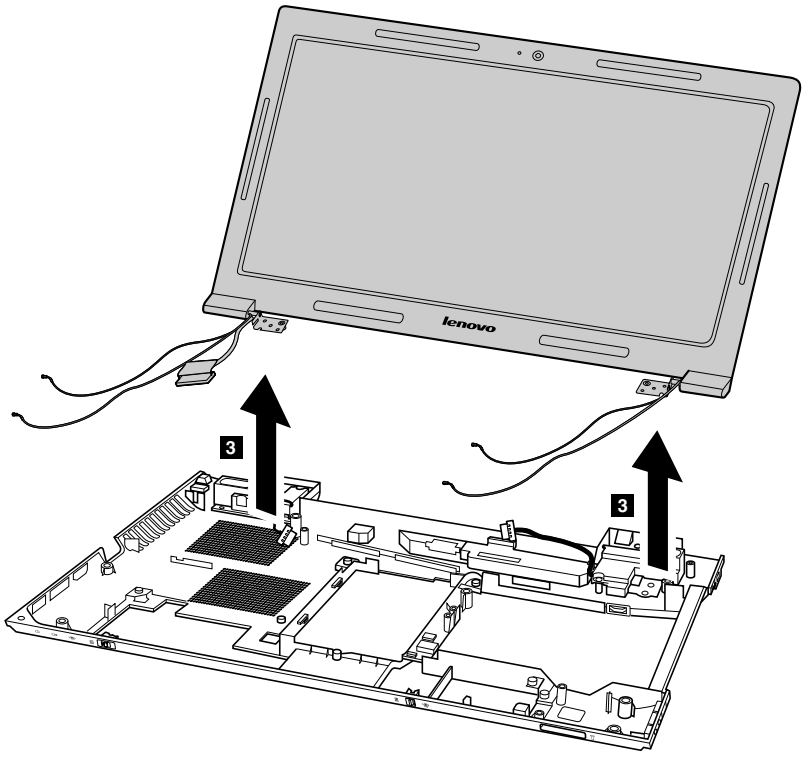


Step	Screw (quantity)	Color	Torque
2	M2.5 × 6 mm, flat-head, nylon-coated (4)	White	2.5 kgfcm

When installing:

- Route the antenna cables along the cable guides. As you route the cables, make sure that they are not subjected to any tension. Tension could cause the cables to be damaged by the cable guides, or a wire to be broken.
- Make sure that the LCD connector is attached firmly and make sure that you do not pinch the antenna cables when you attach the LCD assembly. Route the LCD cable along the cable guides.

Remove the LCD unit in the direction shown by the arrows **3**.



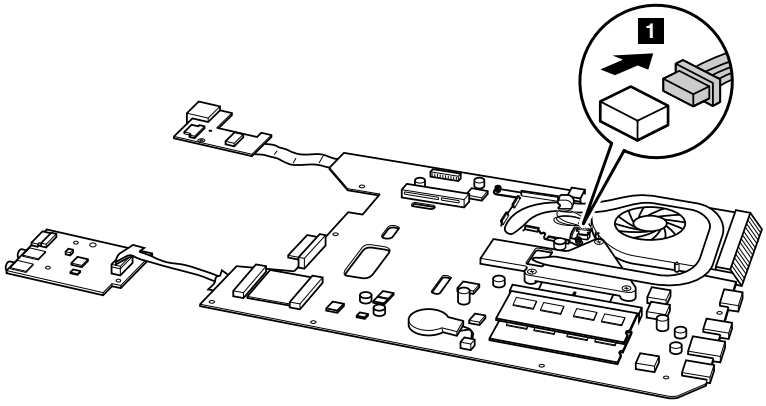
1120 Fan assembly and heat sink assembly

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1100 System board assembly” on page 56

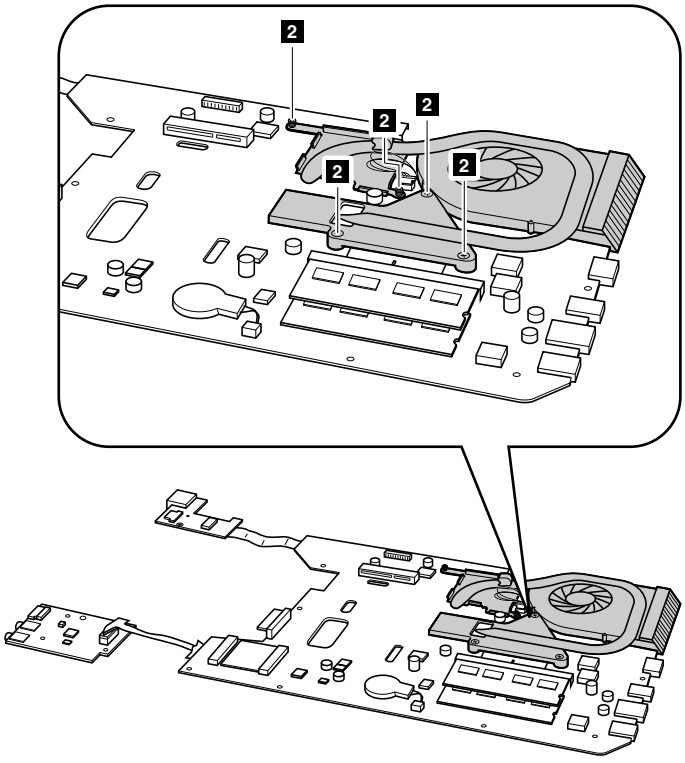
Removal steps of fan assembly and heat sink assembly

Detach the fan connector in the direction shown by the arrow **1**.

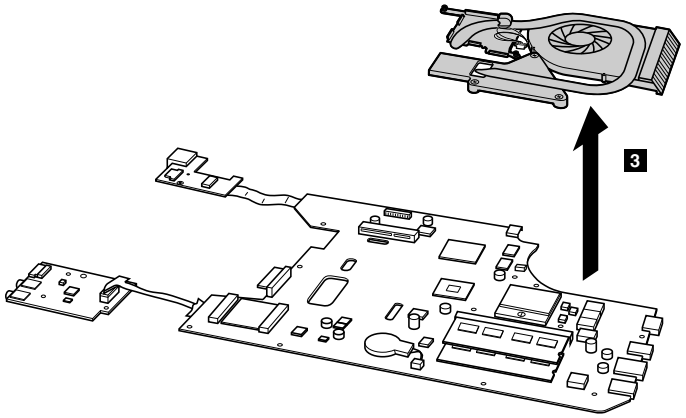


When installing: Make sure that the fan connector is attached firmly to the system board.

Loosen the screws **2**.



Lift the fan assembly and heat sink assembly in the direction shown by the arrow 3. Be careful not to damage the connector.



1130 CPU

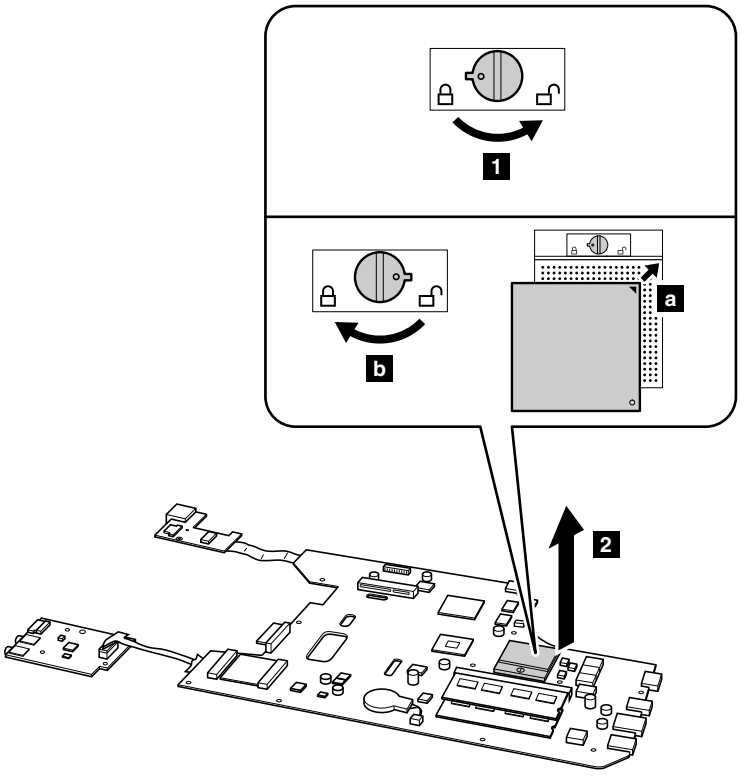
For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1100 System board assembly” on page 56
- “1120 Fan assembly and heat sink assembly” on page 60

Attention: The CPU is extremely sensitive. When you service the CPU, avoid any kind of rough handling.

Removal steps of CPU

Rotate the head of the screw in the direction shown by the arrow 1 to release the lock, then remove the CPU in the direction shown by arrow 2 .



When installing: Place the CPU on the CPU socket in the direction shown by arrow a, and then rotate the head of the screw in the direction shown by arrow b to secure the CPU.

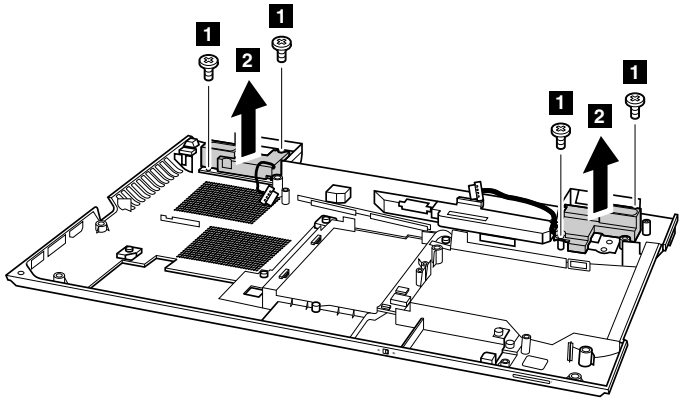
1140 Base cover, speakers, and bluetooth daughter card

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1110 LCD unit” on page 58
- “1100 System board assembly” on page 56

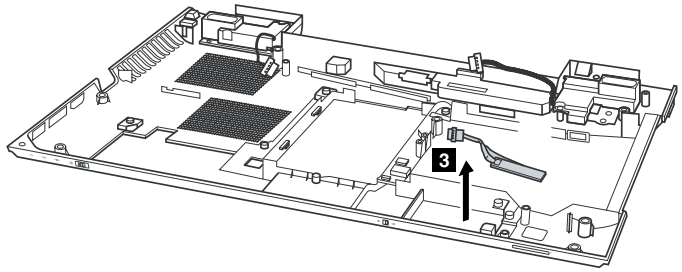
Removal steps of base cover, speakers and bluetooth daughter card

Remove the screws 1, and then remove the speakers in the direction shown by the arrows 2.



Step	Screw (quantity)	Color	Torque
1	M2 × 3.5 mm, flat-head, nylon-coated (4)	Black	2.5 kgfcm

Remove the bluetooth daughter card in the direction shown by the arrow 3.



Applying labels to the base cover

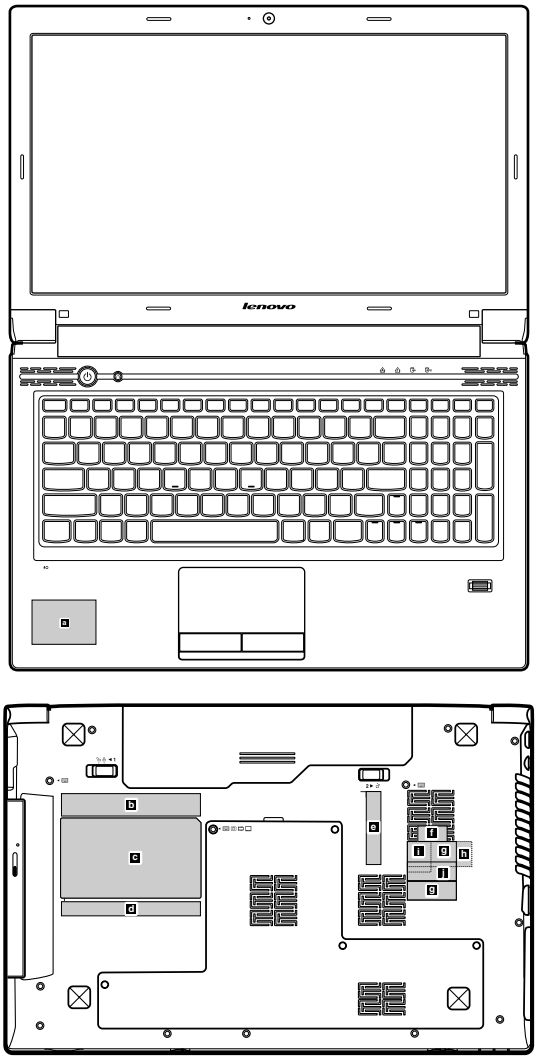
The new base cover FRU is shipped with a kit containing labels of several kinds. When you replace the base cover, you need to apply the following label:

The following labels need to be peeled off from the old base cover, and need to be put on the new base cover.

- **a** Palmrest Label
- **b** PRC/MTM Label
- **c** Rating Label
- **d** COA Label
- **e** Wistron Label
- **f** Malaysia SIRIM Label
- **g** Brazil Label (WLAN) or WLAN Label for US/CA/TW or Israel LBL for WLAN
- **h** PPT Label
- **I** Indonesia WLAN&BT LBL
- **j** Brazil Label (BT) or BT Label for US/CA/TW

For some models, you also need to apply one or two FCC labels. Check the old base cover; if it has one or two FCC labels, find duplicates of them in the label kit and apply them to the new base cover.

For the location of each label, refer to the following figures:



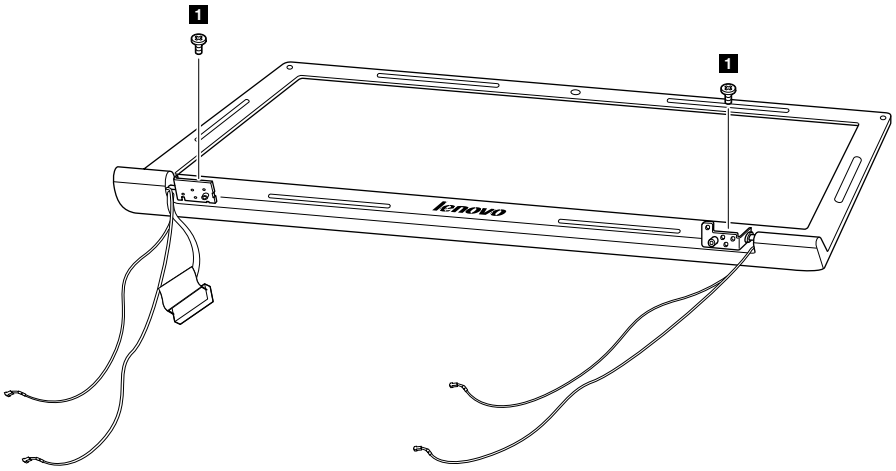
1150 LCD front bezel

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1100 System board assembly” on page 56
- “1110 LCD unit” on page 58

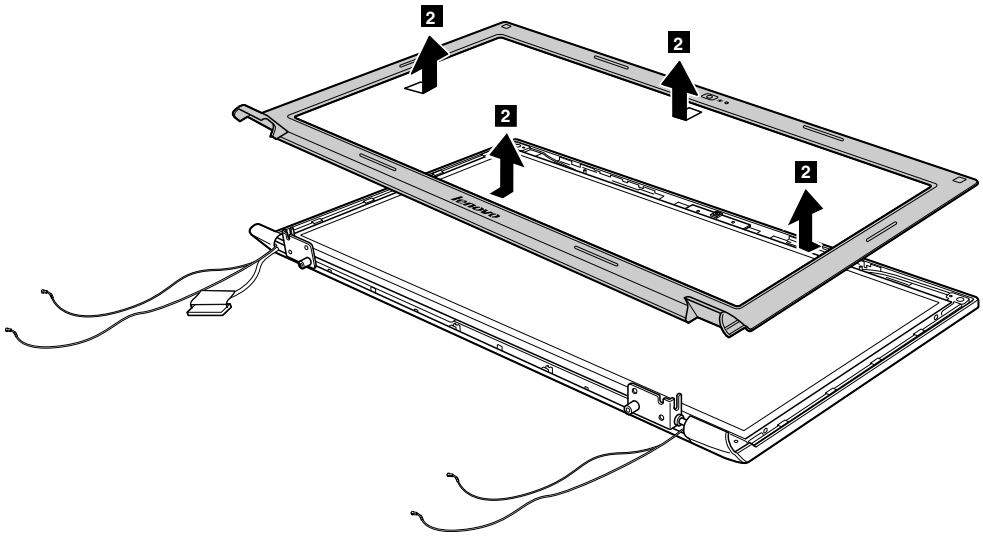
Removal steps of LCD bezel assembly

Remove the screws **1**.



Step	Screw (quantity)	Color	Torque
1	M2.5 × 4 mm, flat-head, nylon-coated (2)	White	2.5 kgfcm

Remove the LCD front bezel in the direction shown by the arrows **2**.



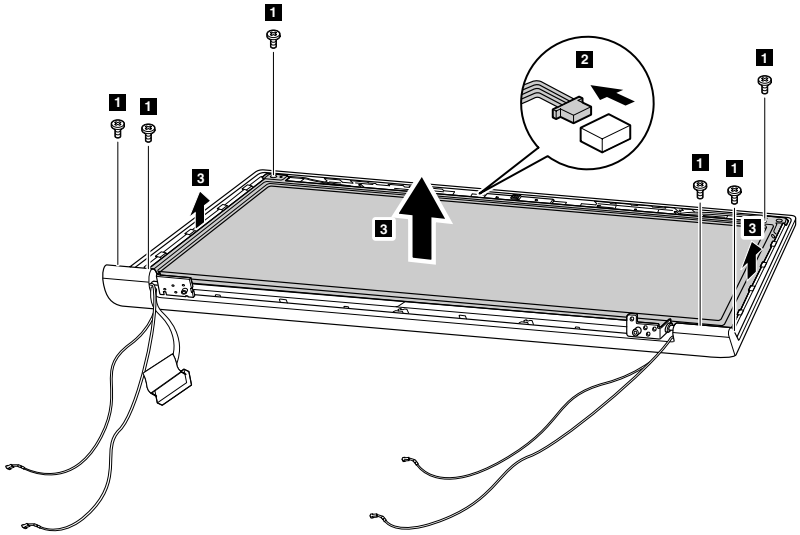
1160 LCD panel, LCD cable, and hinges

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1100 System board assembly” on page 56
- “1110 LCD unit” on page 58
- “1150 LCD front bezel” on page 66

Removal steps of LCD panel, LCD cable, and hinges

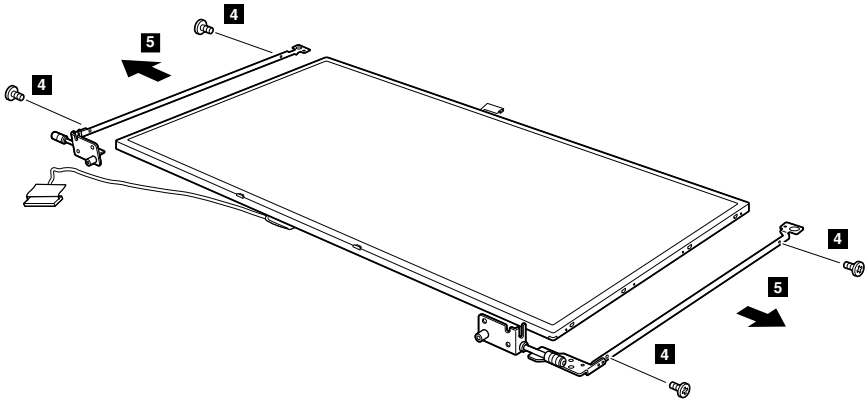
Remove six screws 1. Unplug the integrated camera connector in the direction shown by the arrow 2. Lift the LCD panel in the direction shown by the arrows 3.



When installing: Make sure that the connector is attached firmly.

Step	Screw (quantity)	Color	Torque
1	M2.5 × 4 mm, flat-head, nylon-coated (6)	White	2.5 kgfcm

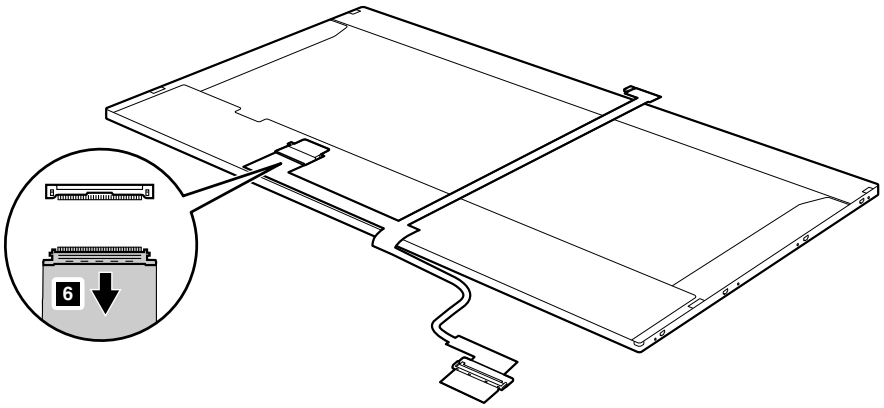
Remove the screws 4 and remove the hinges in the direction shown by the arrow 5.



Step	Screw (quantity)	Color	Torque
4	M2 × 2.5 mm, flat-head, nylon-coated (4)	Black	1.5 kgfcm

Note: The LCD cables are attached to the LCD panel by a metal connector.

Peel off the adhesive tape and detach the connector in the direction shown by the arrow 6.



When installing: Make sure that the metal connector is attached firmly.

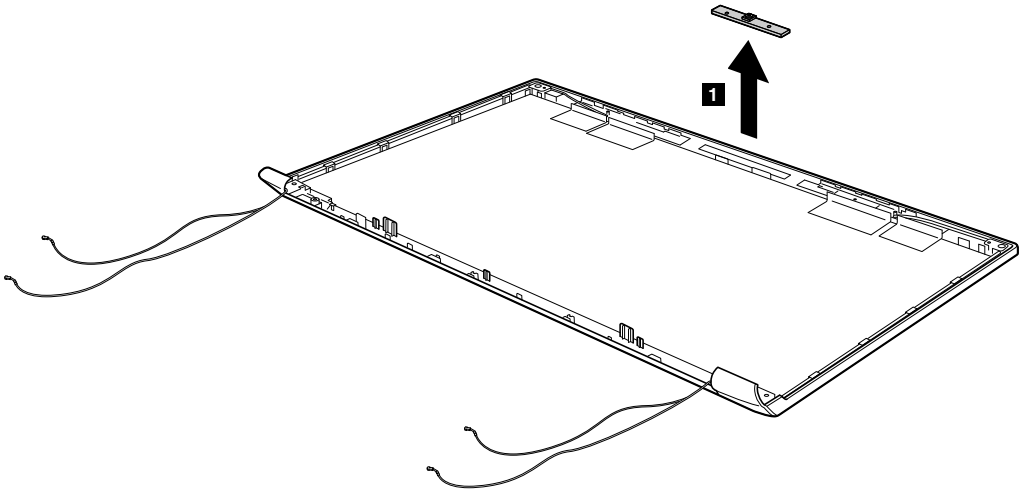
1170 Integrated camera

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1100 System board assembly” on page 56
- “1110 LCD unit” on page 58
- “1150 LCD front bezel” on page 66
- “1160 LCD panel, LCD cable, and hinges” on page 67

Removal steps of integrated camera

Note: The integrated camera is stuck on the top center of the LCD cover. Remove the integrated camera from the LCD cover **1**.



When installing: Stick the integrated camera to the top center of the LCD cover and ajust the placement of it to make sure the connector is attached firmly.

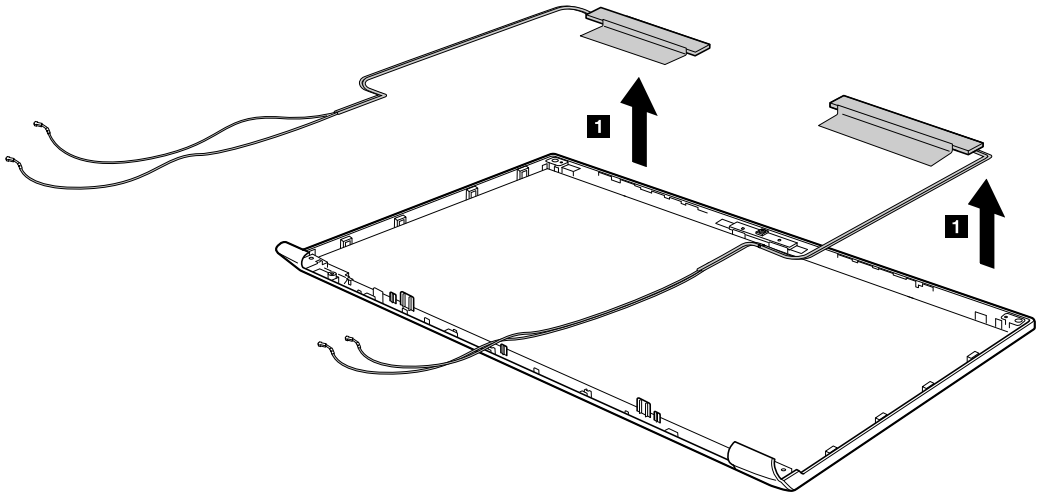
1180 Antenna assembly and LCD cover

For access, remove these FRUs in order:

- “1010 Battery pack” on page 46
- “1020 Dummy card” on page 47
- “1030 Hard disk drive (HDD)/memory module/mini PCI Express Card slot compartment cover” on page 47
- “1040 Hard disk drive” on page 48
- “1050 Optical drive” on page 49
- “1060 Memory module” on page 50
- “1070 PCI Express Mini Card for wireless LAN/WAN” on page 51
- “1080 Keyboard” on page 53
- “1090 Keyboard bezel” on page 54
- “1100 System board assembly” on page 56
- “1110 LCD unit” on page 58
- “1150 LCD front bezel” on page 66
- “1160 LCD panel, LCD cable, and hinges” on page 67

Removal steps of antenna assembly and LCD cover

Peel off the adhesive tapes securing the antenna boards, release the cables from the cable guide, and then remove the antenna assembly in the direction shown by the arrows **1**.



When installing: Route the antenna cables along the cable guides and secure the antenna boards with adhesive tapes. As you route the cables, make sure that they are not subjected to any tension. Tension could cause the cables to be damaged by the cable guides, or a wire to be broken.

Chapter 8. Locations

Front view

1 Integrated camera (Select models only)

2 Wireless module antennas (Select models only)

3 Speaker

4 Power button

5 OneKey Rescue System button

6 Built-in microphone

7 GPU (Graphics Processing Unit) switch (Select models only)

8 System status indicators[1]

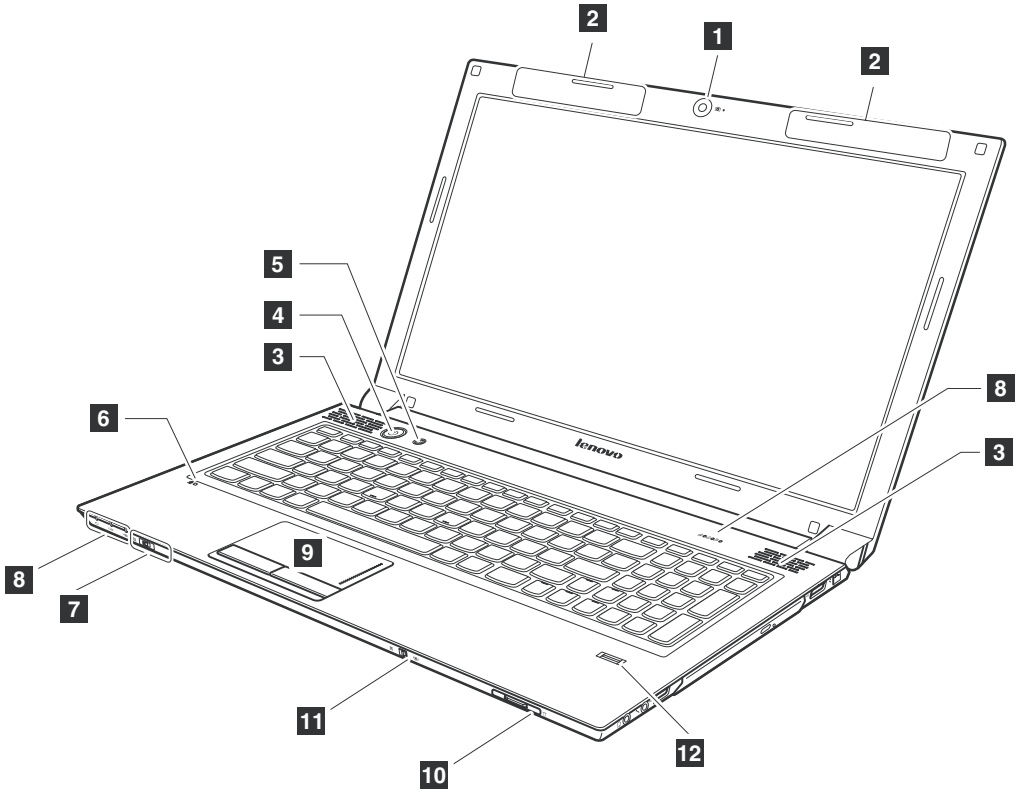
9 Touchpad

10 Memory card slot

11 Wireless device switch (Select models only)

12 Fingerprint reader (V570 and B570) (Select models only)

[1]: For the description of the indicator, see “Status indicators” on page 39.



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Right-side view

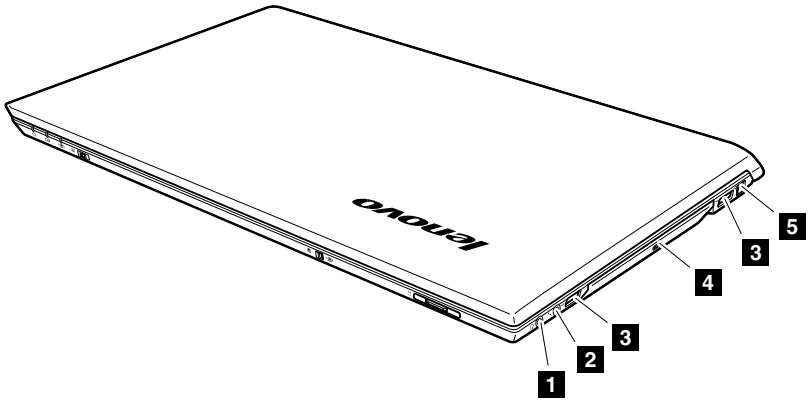
1 Headphone jack

2 Microphone jack

3 USB connectors

4 Optical drive

5 RJ-45 port



Bottom and left-side view

1 Kensington slot

2 ac power adapter jack

3 Fan louvers

4 VGA port

5 HDMI port (Select models only)

6 eSATA/USB combo port (Select models only)

7 USB connector

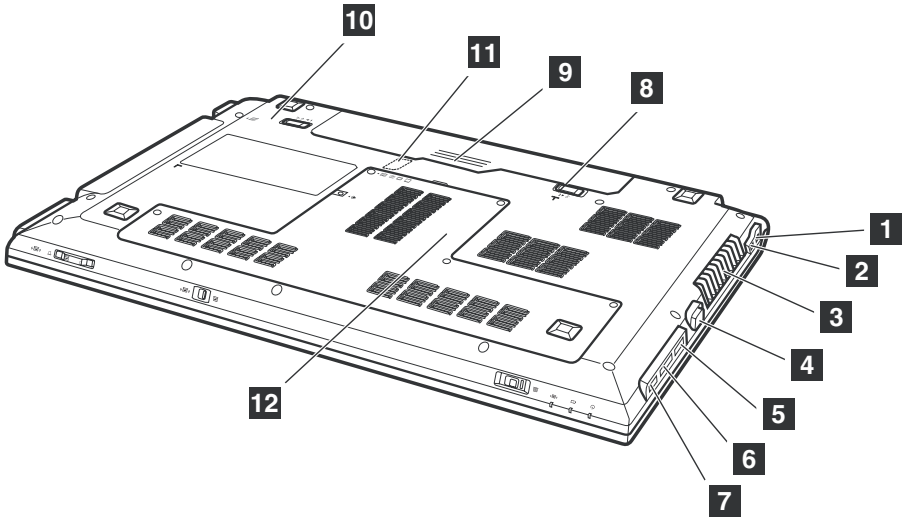
8 Battery latch (spring loaded)

9 Battery pack

10 Battery latch (manual)

11 SIM card slot (Select models only)

12 Hard disk drive (HDD)/Memory/Mini PCI Express Card slot compartment



Chapter 9. Parts list

This chapter contains following lists of the service parts.

- “Overall” on page 76
- “LCD FRUs” on page 80
- “Keyboard” on page 81
- “Miscellaneous parts” on page 82
- “ac power adapters” on page 83
- “Power cords” on page 83

External CRU statement to customers:
Some problems with your product can be resolved with a replacement part you can install yourself, called a “Customer Replaceable Unit” or “CRU.” Some CRUs are designated as Self-service CRUs and others are designated as Optional-service CRUs. *Installation of Self-service CRUs is your responsibility; you may request that Lenovo installs an Optional-service CRU according to the warranty service for your product.* Where you are installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You may find a list of CRUs in the publications that ship with your product or at http://www.lenovo.com/CRUs. You may be required to return the defective part that is replaced by the CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you may be charged for the replacement CRU if Lenovo does not receive the defective part within thirty (30) days of your receipt of the replacement CRU. See your Lenovo Limited Warranty documentation for full details.

Lenovo computers contain the following types of CRUs:

- **Self-service CRUs:**These CRUs unplug or are held by no more than two screws. Examples of these types of CRUs include an ac power adapter, a power cord, a battery, and a hard disk drive. Other Self-service CRUs depending on product design may include a memory module, a wireless card, a keyboard, and a palm rest with finger print reader and touchpad.
- **Optional-service CRUs:** These CRUs are isolated parts within the computer that are concealed by an access panel that is typically secured by more than two screws. Once the access panel is removed, the specific CRU is visible.

Note: Each FRU is available for all types or models, unless specific types or models are specified.

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Overall

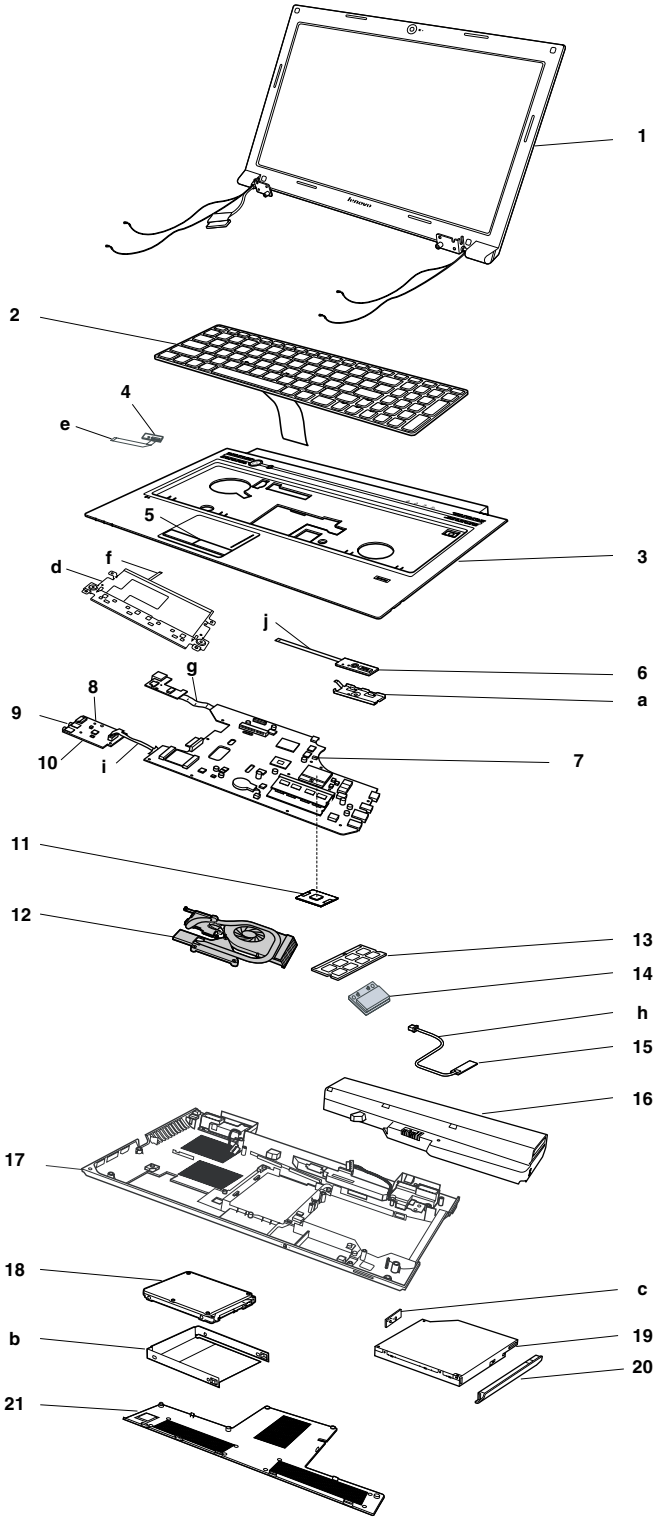

Table 4. Parts list—Overall

No.	FRU (Overall)	FRU no.	CRU ID
1	LCD unit (see “LCD FRUs” on page 80.)		
2	Keyboard (see “Keyboard” on page 81.)		
3	LA57 TOP CASE GRAY W/TP&MIC (V570)	31048974	N
3	LA57 TOP CASE DARK GRAY W/TP&MIC (V570)	31051122	N
3	LB57 UPPER CASE ASSY W/TP&MIC (B570)	31048999	N
3	LB57E Upper Case TEX-BLK W/TP.MIC (B570e)	31052087	N
4	LA57 POWER BOARD	11013298	N
5	LA57 TP BUTTON GRAY W/CABLE	31048975	N
5	LA57 TP BUTTON DARK GRAY W/CABLE (V570)	31051121	N
6	LA57 FINGER PRINT BOARD (V570 and B570)	31048991	N
6	LB57E FingerPrint Dummy Card (B570e)	31052088	N
7	LA57 MB UMA W/O CPU DRAM W/3G/HDMI/APS (V570)	11013294	N
7	LA57 MB UMA FOR DUAL CORE W/3G/HDMI/APS (V570)	11013377	N
7	LA57 MB SG N12-1G HY7/SA8 W/3G/HDMI/APS (V570)	11013295	N
7	LA57 MB SG N12-2G HY5/SA6 W/3G/HDMI/APS (V570)	11013296	N
7	LA57 MB UMA FOR QC NEW W/3G/HDMI/APS B3 (V570)	11013532	N
7	LA57 MB UMA FOR DC NEW W/3G/HDMI/APS B3 (V570)	11013533	N
7	LA57 MB SG GE-1G W/3G/HDMI/APS/BT B3 (V570)	11013534	N
7	LA57 MB SG GE-2G W/3G/HDMI/APS/BT B3 (V570)	11013535	N
7	LA57 MB SG GS-2G W/3G/HDMI/APS/BT B3 (V570)	11014106	N
7	LA57 MB SG GS-1G W/3G/HDMI/APS/BT B3 (V570)	11014128	N
7	LB57 MB UMA W/3G/HDMI WO/CPU/DRAM/APS (B570)	11013297	N
7	LB57 MB UMA NEW W/3G/HDMI WO/APS B3 (B570)	11013536	N
7	LB57 MB SG 1G W/3G/HDMI WO/APS B3 (B570)	11013537	N
7	LB57 MB SG 1G 8L W/3G/HDMI WO/APS B3 (B570)	11013650	N
7	LB57 MB SG 512M W/3G/HDMI WO/APS B3 (B570)	11013538	N
7	LB57 MB SG 512M 8L W/3G/HDMI WO/APS B3 (B570)	11013651	N
7	LB57E MB UMA W/HDMI WO/3G/APS (B570e)	11014073	N
7	LB57E MB DIS GS-1G W/HDMI WO/3G/APS (B570e)	11014185	N
8	LA57 RJ45/USB BOARD	31048988	N
9	LA57 IO BOARD	11013299	N
10	LA57 SD DUMMY CARD	31048994	*
11	Intel I7-2820QM 2.30G 8M 4c D2 PGA processor	102001055	N
11	Intel I7-2720QM 2.20G 6M 4c D2 PGA processor	102001071	N
11	Intel I7-2630QM 2.0G 6M 4c D2 PGA processor	102001070	N
11	Intel I7-2620M 2.7G 4M 2c J1 PGA processor	102001069	N
11	Intel I5-2540M 2.6G 3M 2c J1 PGA processor	102001068	N

Table 4. Parts list—Overall (continued)

No.	FRU (Overall)	FRU no.	CRU ID
11	Intel I5-2520M 2.5G 3M 2c J1 PGA processor	102001067	N
11	Intel I5-2410M 2.3G 3M 2c J1 PGA processor	102001066	N
11	Intel I3-2310M 2.1G 3M 2c J1 PGA processor	102001065	N
12	LA57 THERMAL ASSY UMA (FOX+DELTA)	31048982	N
12	LA57 THERMAL ASSY DIS (FOX+DELTA)	31048983	N
13	DDRIII 1333 1GB, M471B2873FHS-CH9 (Rev F/1Gb/ 46nm)	11011936	**
13	DDRIII 1333 1GB, RMT1910MD66E7F-1333 (V69A/2Gb/ 50nm)	11012427	**
13	DDRIII 1333 1GB, HMT112S6DFR8C-H9 N0 (Rev Vega/ 1Gb/44nm)	11012767	**
13	DDRIII 1333 1GB, RMT3010EF48E7W-1333 (Rev.F/1Gb/ 60nm)	11012634	**
13	DDRIII 1333 1GB, SY321NG08HBF (Vega/1Gb/44nm)	11012810	**
13	DDRIII 1333 2GB, M471B5773CHS-CH9(Rev C/2Gb/46nm)	11012630	**
13	DDRIII 1333 2GB, EBJ21UE8BFU0-DJ-F (Rev.F/1Gb/ 60nm)	11012608	**
13	DDRIII 1333 2GB, RMT1950MD58E8F-1333 (V69A/2Gb/ 50nm)	11012213	**
13	DDRIII 1333 2GB, HMT325S6BFR8C-H9 N0 (Rev Vega/ 2Gb/44nm)	11012197	**
13	DDRIII 1333 2GB, RMT3020EF48E8W-1333 (Rev F/1Gb/ 60nm)	11012633	**
13	DDRIII 1333 2GB, SY321NH08HAF (Vega/2Gb/44nm)	11012809	**
13	DDRIII 1333 4GB, M471B5273CH0-CH9 (Rev C/2Gb/46nm)	11011934	**
13	DDRIII 1333 4GB, HMT351S6BFR8C-H9 N0 (Vega/2Gb/ 44nm)	11012199	**
13	DDRIII 1333 4GB, MT16JSF51264HZ-1G4D1 (Rev V69A/ 2Gb/50nm)	11012320	**
14	WLAN card, 802.11a/g/n && 802.16e, Intel 6250NX MOW M PCIE NB HMC	20002321	**
14	WLAN card, 802.11a/g/n && 802.16e, Intel 6250GX MOW M PCIE NB HMC	20002388	**
14	WLAN card, 802.11a/g/n && 802.16e, Intel 6150NX MOW M PCIE NB HMC	20002484	**
14	WLAN card, 802.11a/g/n && 802.16e, Intel 6150GX MOW M PCIE NB HMC	20002529	**
14	WLAN card, 802.11 b/g/n 1 × 2, Intel 1000N MOW M PCIE NB HMC	20002329	**
14	WLAN card, 802.11 b/g/n 2 × 2, Cbt BCM43227 MOW M PCIE NB HMC	20002506	**
14	WLAN card, 802.11 b/g/n 2 × 2, Liteon HB97 MOW M PCIE NB HMC	20002525	**
14	WLAN card, 802.11 b/g/n 1 × 1, Cbt BCM4313 MOW M PCIE NB HMC	20002505	**
14	WLAN card, 802.11 b/g/n 1 × 1, Liteon AR9285 HB95 BGN MOW NB	20002357	**
14	WWAN card, WCDMA/HSDPA 7.2M, Ericsson F3307 R2 HSPA 900/2100MHz WWAN	11012853	**
14	WWAN card, WCDMA/HSDPA 7.2M, Ericsson F3307 R2 HSPA 850/1900MHz WWAN	11012852	**
14	WWAN card, WCDMA/HSDPA 7.2M, Huawei EM770W WCDMA+GPS MiniPCIE WWAN	11011800	**
14	WWAN card, WCDMA/HSDPA 7.2M, Huawei EM820 HSPA+850/900/1900/2100MHz	11012850	**
14	WWAN card, EVDO, Huawei EM660 EVDO+GPS WWAN card	11012299	**
14	WWAN card, TD-SCDMA, Leadcoretech TD-SCDMA LC5740 Mini-Card	11012849	**
15	Bluetooth card, BT2.1 + EDR, Fcn BCM92070 BT2.1 EDR Flash U NB	20002266	N
15	Bluetooth card, BT2.1 + EDR, USI BCM92070 BT2.1 EDR Flash U NB	20002326	N
16	Battery pack, 6 cell 2.2 Ah, Sanyo L09S6Y02 3S2P 48Wh bty (LH) Comm01	121001091	*

Table 4. Parts list—Overall (continued)

No.	FRU (Overall)	FRU no.	CRU ID
16	Battery pack, 6 cell 2.2 Ah, Pana L10P6Y22 3S2P 48Wh bty Comm01	121001096	*
16	Battery pack, 6 cell 2.2 Ah, SMP/LG L09M6Y02 3S2P 48Wh bty (LH) Comm01	121001094	*
16	Battery pack, 6 cell 2.2 Ah, Celx/S L10C6Y02 3S2P 48Wh bty (LH) Comm01	121001071	*
16	Battery pack, 6 cell 2.8 Ah, Pana L10P6F21 3S2P 62Wh bty Comm01	121001097	*
16	Battery pack, 6 cell 2.8 Ah, SMP/S L10M6F21 3S2P 62Wh bty(LH) Comm01	121001095	*
17	LA57 LOWER CASE UMA W/SPEAKER&DC-IN (V570/B570)	31048976	N
17	LA57 LOWER CASE DIS W/SPEAKER&DC-IN (V570/B570)	31048977	N
17	LB57 LOWER CASE UMA W/SPK/DC-IN/SIM (V570/B570)	31049535	N
17	LB57 LOWER CASE DIS W/SPK/DC-IN/SIM (V570/B570)	31049536	N
17	LA57 LOWER CASE UMA NEW W/SPEAKER/DC-IN (V570/B570)	31049963	N
17	LA57 LOWER CASE DIS NEW W/SPEAKER/DC-IN (V570/B570)	31049958	N
17	LB57 LOWER CASE UMA NEW W/SPK/DC-IN/SIM (V570/B570)	31049964	N
17	LB57 LOWER CASE DIS NEW W/SPK/DC-IN/SIM (V570/B570)	31049965	N
17	LA57 LOWER CASE UMA NEW W/SPEAKER/DC-IN (B570e)	31049963	N
18	Hard disk drive, 320G 5400rpm SATA, WD 4K sector 320GN 5400RPM 250G	16004853	*
18	Hard disk drive, 320G 5400rpm SATA, Hitachi HTS545032B9A300 320G 9NB	16004059	*
18	Hard disk drive, 320G 5400rpm SATA, Hitachi HTS543232A7A384 5400RPM 320G	16005024	*
18	Hard disk drive, 320G 5400rpm SATA, Seagate ST320LT020 5400RPM 7MM 320G	16005211	*
18	Hard disk drive, 320G 5400rpm SATA, Toshiba MK3265GSX 5400RPM 320G	16004642	*
18	Hard disk drive, 500G 5400rpm SATA, Seagate ST9500325AS 500G 9NB	16004189	*
18	Hard disk drive, 500G 5400rpm SATA, WD5000BPVT- 24HXZT1 5400RPM 500G	16004846	*
18	Hard disk drive, 500G 5400rpm SATA, Hitachi HTS545050B9A300 500G 9NB	16004058	*
18	Hard disk drive, 500G 5400rpm SATA, Toshiba MK5065GSX 5400RPM 500G	16004643	*
18	Hard disk drive, 640G 5400rpm SATA, WD6400BPVT- 24HXZT1 5400RPM 640G	16004847	*
18	Hard disk drive, 640G 5400rpm SATA, Toshiba MK6465GSX 5400RPM 640G	16004644	*
18	Hard disk drive, 750G 5400rpm SATA, WD7500BPVT- 24HXZT1 5400RPM 750G	16004848	*
18	Hard disk drive, 320G 7200rpm SATA, Hitachi HTS725032A9A364 7200RPM 320G	16004530	*
18	Hard disk drive, 320G 7200rpm SATA, Seagate ST9320423AS 7200RPM320G 9NB	16004533	*
18	Hard disk drive, 320G 7200rpm SATA, WD WD3200BEKT 7200RPM 320G	16005212	*
18	Hard disk drive, 320G 7200rpm SATA, Hitachi HTS723232A7A364 7200RPM 320G	16005027	*
18	Hard disk drive, 320G 7200rpm SATA, Seagate ST320LT007 7200RPM 7MM 320G	16005030	*
18	Hard disk drive, 500G 7200rpm SATA, Hitachi HTS725050A9A364 7200RPM 500G	16004531	*
18	Hard disk drive, 500G 7200rpm SATA, Seagate ST9500420AS 7200RPM500G 9NB	16004532	*
18	Hard disk drive, 500G 7200rpm SATA, WD5000BEKT- 24KA9T0 7200RPM 500G	16004850	*
19	Optical drive, 12.7mm Tray Rambo, PLDS DS-8A5S Tray in Rambo	25011187	**
19	Optical drive, 12.7mm Tray Rambo, Optiarc AD-7710H Tray in Rambo	25011218	**
19	Optical drive, 12.7mm Tray Rambo, TSST TS-L633F Tray in Rambo	25011201	**

Table 4. Parts list—Overall (continued)

No.	FRU (Overall)	FRU no.	CRU ID
19	Optical drive, 12.7mm Tray Rambo, PSN UJ8A0 Tray in Rambo	25011472	**
19	Optical drive, 12.7mm BD Combo, PLDS DS-6E2S Tray in BD Combo	25011471	**
19	Optical drive, 12.7mm BD Combo, HLDS CT30N Tray in BD Combo	25011473	**
20	LA57 ODD BEZEL ASSY Tray in RAMBO	31048981	**
20	LA57 ODD BEZEL ASSY BLUE RAY COMBO	31050482	**
21	LA57 HDD DOOR ASSY	31048978	N

LCD FRUs

In Lenovo V570, B570, and B570e models, the type of LCD is 15.6-in. HD TFT.

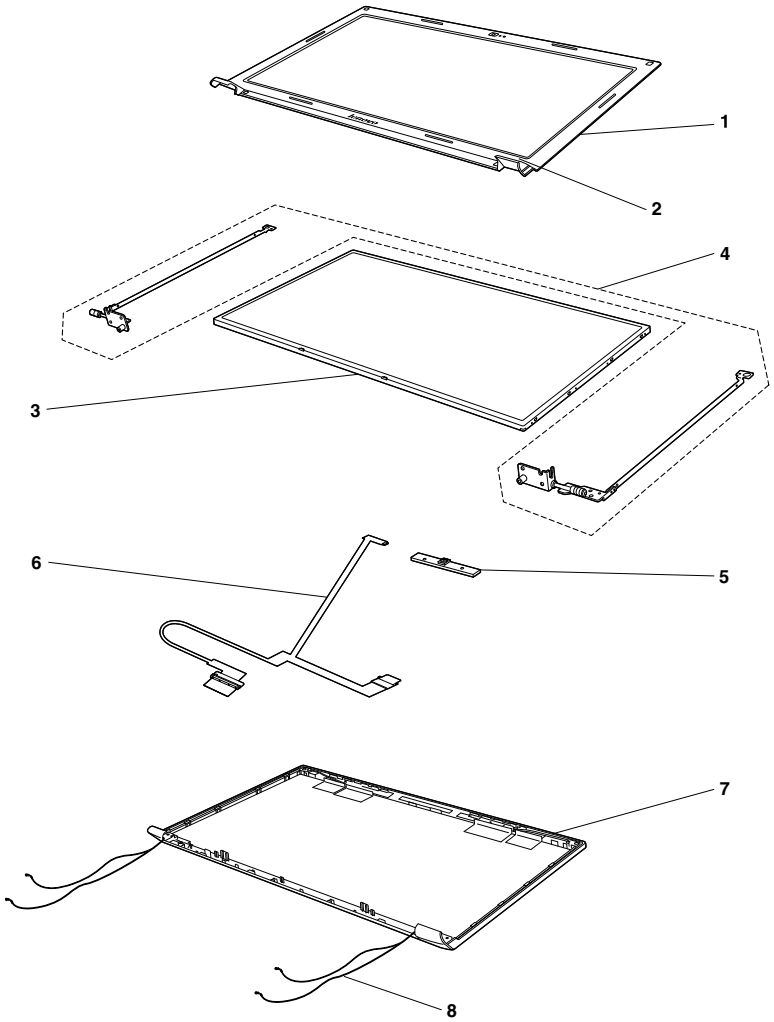

Table 5. Parts list — 15.6-in. HD TFT

No.	FRU	FRU no.	CRU ID
1	LA57 LCD BEZEL W/CAMERA HOLE (V570)	31048965	N
1	LB57 LCD BEZEL W/CAMERA HOLE (B570)	31048998	N
1	LB57E LCD Bezel Black W/Camera Hole (B570e)	31052086	N
2	LA57 LCD SCREW HING MYLAR	31048973	N
3	15.6 HD LED Panel, B156XW02 V2	18004799	N
3	15.6 HD LED Panel, N156BGE-L21	18004798	N
3	15.6 HD LED Panel, LP156WH4-TLA1	18004797	N
3	15.6 HD LED Panel, LTN156AT16-L01	18004796	N
3	15.6 HD LED Panel, M156NWR2 R0	18004795	N
4	LA57 LCD BRACKET W/HINGE LEFT	31048967	N
4	LA57 LCD BRACKET W/HINGE RIGHT	31048971	N
5	LA47 Camera 2M 56.18007.611/2/11.512/4 (V570)	31047643	N
5	LB47 CAMEAR VGA CHICONY/LITEON/BISON (B570/B570e)	31049002	N
6	LA57 LCD CABLE W/CAMERA CABLE	31048972	N
7	LA57 LCD COVER GRAY W/WLAN ANTENNA (V570)	31048966	N
7	LA57 LCD COVER DARK GRAY W/WLAN ANTENNA (V570)	31051120	N
7	LB57 LCD COVER W/WLAN ANTENNA (B570)	31048997	N
7	LB57E LCD Cover TEX-BLK W/Antenna (B570e)	31052085	N
8	LA57 LED BOARD W/CABLE (V570)	31048985	N
8	LB57 LED BOARD W/CABLE (B570/B570e)	31048995	N

Keyboard

Table 6. Parts list - Keyboard

Language	FRU no. (Dafan)	FRU no. (Chicony)	FRU no. (Sunrex)
Arabic	25012639	25012361	25012462
Belgian	25012656	25012369	25012470
Brazilian Portuguese	25012641	25012362	25012463
Bulgarian	25012682	25012375	25012732
Czech	25012681	25012374	25012731
C& Nordics (Danish/Finnish/Swedish/Norwegian/English)	25012655	25012368	25012469
Dutch	25012646	25012364	25012465
French	25012637	25012729	25012460
French, English	25012633	25012377	25012456
German	25012638	25012360	25012461

Table 6. Parts list - Keyboard (continued)

Language	FRU no. (Dafan)	FRU no. (Chicony)	FRU no. (Sunrex)
Greek	25012647	25012365	25012466
Hebrew	25012650	25012366	25012467
Hungarian	25012652	25012367	25012468
Icelandic	25012659	25012370	25012471
Italian	25012627	25012721	25012448
Japanese	25012644	25012363	25012464
Korean	25012634	25012376	25012457
Latin	25012632	25012726	25012455
Portuguese	25012631	25012725	25012454
Russian	25012636	25012728	25012459
Swiss	25012664	25012372	25012473
Slovenian	25012661	25012371	25012472
Spanish	25012628	25012722	25012450
Thai	25012630	25012724	25012453
Traditional Chinese	25012635	25012727	25012458
Turkish	25012629	25012723	25012452
U.K. English	25012626	25012720	25012451
U.S. English	25012625	25012719	25012449
U.S. English (International, with a Euro symbol)	25012666	25012373	25012474

Miscellaneous parts

Table 7. Parts list - Miscellaneous parts

FRU	FRU no.
(a) LA57 FP BRACKET (V570 and B570)	31048993
(b) LA57 HDD BRACKET ASSY	31048979
(c) LA57 ODD BRACKET	31048980
(d) LB57 TOUCHPAD BRACKET (B570 and B570e)	31048996
(e) LA57 POWER BOARD CABLE	31048984
(f) LA57 TOUCHPAD CABLE	31048986
(g) LA57 IO BOARD CABLE	31048990
(h) LA57 BT CABLE	31048987
(i) LA57 RJ45/USB BOARD CABLE	31048989
(j) LA57 FINGER PRINT BOARD CABLE (V570 and B570)	31048992

Note: Italicized letters in parentheses are references to the exploded view in “Overall” on page 76

ac power adapters

Table 8. Parts list — 3-pin ac power adapters

FRU	FRU no.	CRU ID
65 W, Delta ADP-65KH BD, 20 V, 3.25 A adapter	36001929	N
65 W, Liteon PA-1650-56LC adapter	36001651	N
65 W, Chicony CPA-A065, 20 V, 3.25 A adapter (330PF)	36001943	N
65 W, Emerson AA26600L, 20 V, 3.25 A adapter	36001870	N
90 W, Delta ADP-90DD BD, 20 V, 4.5 A adapter	36001941	N
90 W, Liteon PA-1900-56LC, 20 V, 4.5 A adapter (330PF)	36001927	N
90 W, Chicony CPA-A090, 20 V, 4.5 A adapter (330PF)	36001942	N

Power cords

A Lenovo power cord for a specific country or region is usually available only in that country or region:

Table 9. Parts list — 3-pin power cords (Linetek)

Country or region	FRU no.	CRU ID
Africa • LS15+H03VV-F+PE-364, 1 m	145000586	*
Argentina • LS15+H03VV-F+LP39, 1 m	145000599	*
Australia • LS15+H03VV-F+LP-23A, 1 m	145000589	*
Brazil • LS15 H03VV-F LP26A, 1 m	145000596	*
CCC • PC323+RVV300/300+LS15, 1 m	145000600	*
CE • LP-34+H03VV-F + LS15, 1 m	145000585	*
Danmark • LS15+H03VV-F+LP-38, 1 m	145000598	*
Indian • PE-361+ H05VV-F+ LS15, 1 m	145000592	*
Israel • LS15+H03VV-F+LP-41, 1 m	145000595	*
Italy • LS15+H03VV-F+PE-336, 1 m	145000591	*
Japan • LS15+VCTF+LP-54, 1 m	145000587	*

Table 9. Parts list — 3-pin power cords (Linetek) (continued)

Country or region	FRU no.	CRU ID
Korea • LS15+H05VV-F+LP-E04A, 1 m	145000590	*
Switzerland • LS15+H03VV-F+LP-37, 1 m	145000597	*
Taiwan • LS15+VCTF+LP-53, 1 m	145000588	*
U.K. • LP-61L+ H03VV-F+ LS15, 1 m	145000593	*
UL • LP-30B + SPT-2 + LS15, 1 m	145000594	*

Table 10. Parts list — 3-pin power cords (Longwell)

Country or region	FRU no.	CRU ID
Africa • LP-39+H03VV-F+LS-18, 1 m	145000554	*
Argentina • LP-24+H03VV-F+LS-18, 1 m	145000567	*
Australia • LP-23A+LFC-3R+LS-18, 1 m	145000557	*
Brazil • LP-46+H03VV-F+LS-18, 1 m	145000564	*
CCC • LSG-31+RVV300/300+LS-18, 1 m	145000568	*
CE • Longwell LP-34A+H03VV-F+LS-18, 1 m	145000553	*
Danmark • LP-40+H03VV-F+LS-18, 1 m	145000566	*
Indian • LP-67+BIS+LS-18, 1 m	145000560	*
Israel • LP-41+H03VV-F+LS-18, 1 m	145000563	*
Italy • LP-22+H03VV-F+LS-18, 1 m	145000559	*
Japan • LP-54+VCTF+LS-18, 1 m	145000555	*
Korea • LP-486+KTLH03VV-F+LS-5, 1 m	145000558	*

Table 10. Parts list — 3-pin power cords (Longwell) (continued)

Country or region	FRU no.	CRU ID
Switzerland • LP-37+H03VV-F+LS-18, 1 m	145000565	*
Taiwan • LP-71+VCTF+LS-33, 1 m	145000556	*
U.K. • LP-61L+H03VV-F+LS-18, 1 m	145000561	*
UL • LP-30B+SPT-2 18AWG+LS-18, 1 m	145000562	*

Table 11. Parts list — 3-pin power cords (Volex)

Country or region	FRU no.	CRU ID
Argentina • LP-24+H03VV-F+LS-18, 1 m	145000528	*
Australia • LP-23A+LFC-3R+LS-18, 1 m	145000532	*
Brazil • LP-46+H03VV-F+LS-18, 1 m	145000527	*
CCC • LSG-31+RVV300/300+LS-18, 1 m	145000538	*
CE • LP-34A+H03VV-F+LS-18, 1 m	145000525	*
Danmark • LP-40+H03VV-F+LS-18, 1 m	145000534	*
Indian • LP-67+BIS+LS-18, 1 m	145000536	*
Israel • LP-41+H03VV-F+LS-18, 1 m	145000526	*
Italy • LP-22+H03VV-F+LS-18, 1 m	145000535	*
Japan • LP-54+VCTF+LS-18, 1 m	145000530	*
Korea • LP-486+KTLH03VV-F+LS-5, 1 m	145000533	*
Switzerland • LP-37+H03VV-F+LS-18, 1 m	145000524	*
Taiwan • LP-71+VCTF+LS-33, 1 m	145000531	*

Table 11. Parts list — 3-pin power cords (Volex) (continued)

Country or region	FRU no.	CRU ID
U.K. • LP-61L+H03VV-F+LS-18, 1 m	145000605	*
UL • LP-30B+SPT-2 18AWG+LS-18, 1 m	145000537	*

Table 12. Parts list — 3-pin power cords (others)

Country or region	FRU no.	CRU ID
CCC • SSD YD-118-1+IEC53RVV+SSD-3-2B-1, 1 m	145000602	*

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